SEP 29 1927

The

British Medical Journal

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SENECA, STOIC, PHILOSOPHER AND STATESMAN. A PIONEER OF MODERN RELIGIOUS AND ETHICAL CONCEPTIONS.—From being chiefly a system of philosophy, Stoicism, as developed and modified by the Romans, grew into a religion which went far to promote a spiritual tendency in the materialistic Roman imperial mind and prepared the ground for Christianity. Seneca was the forerunner whose moral earnestness inspired the movement which was continued by Musonius Rufus, Epictetus and Marcus Aurelius. Under his teaching, Stoicism, as a guide to conduct, began to spread among educated people. He taught of the brotherhood of man: "Man is a holy thing to man," he writes, and, calling slaves "humble friends," he urges those who own them, "kindly remember that he whom you call your slave sprang from the same stock, is smiled upon by the same skies, and on equal terms with yourselves breathes, lives and dies." Seneca's teaching led to a more humane treatment of them, and, at length, to the abolition of slavery. He taught the polytheistic Romans "God is near you, he is with you, he is within you." In his views relating to women Seneca was essentially modern; he pleaded for the equality of the sexes and for the sanctity of marriage, insisting on the husband's fidelity equally with that of the wife. He urged the value of the simple life, holding that the soul is never greater than when it has laid aside all extraneous things. The Fathers, on the evidence of his writings, placed Seneca among the Christians; but it has been shown that he had no connection with this growing body.

DATE: Seneca died A.D. 65

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THE TREATMENT OF ACUTE LOBAR PNEUMONIA.

I.—PROPHYLAXIS: SPECIFIC TREATMENT: SYMPTOMATIC TREATMENT.*

BY

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THE question of the treatment of patients suffering from pneumonia is one of paramount importance, and one which appeals to every member of our profession. I realize not only the honour but also the responsibility of being asked to speak as the opener to-day, and my remarks will be made with the object of promoting and exciting a full and free discussion, rather than of urging any particular view or views which I may hold.

Pneumonia is a disease which killed 36,990 persons in England and Wales in 1925, and if we accept a mortality of 20 per cent. there was a case incidence of 185,000. In the city of Liverpool, with a population of 842,968, in one year there were 640 deaths; 3,200 persons were affected, or 1 in every 263 of the population.

It is remarkable that even to-day there is no unanimity as to the actual nature of the disease. It is admittedly an infection, and the causal organism is the pneumococcus, either alone, or in combination with other organisms acting as allies in its attack on the patient; but what is not agreed upon is the method by which infection takes place.

Are we to consider it a primary blood infection, a septicaemia, or is it a disease invading the lungs directly by way of the air passages? In other words, is it to be considered of haematogenic or bronchiogenic origin? This is a question of considerable importance when one comes to discuss the question of specific treatment.

The drift of opinion is away from the conception that pneumonia is primarily a general infection, and towards the view that it is essentially a local infection striving to become general. Accepting the second view, we may say that pneumonia is a specific infectious disease due to the pneumococcus, with the primary site of infection in the lungs.

The outlook in any particular case depends on the virulence and type of the infection, and the local and general resistance of the patient. The infecting pneumococcus may belong to one of four groups.

Professor E. E. Glynn has pooled the American and British figures.[1] His figures show the relative incidence of the types and the associated mortality:

		Mortality.
Type 1	In nearly 1/3 of adults	25%
Type 2	In nearly 1/4 „	33%
Type 3	In nearly 1/10 „	50%
Type 4	In more than 1/4 „	10%

In addition to the pneumococcus, among other organisms the streptococcus or influenzal bacillus may be present.

Pneumonic patients seem to have had a bad time in the past. In the early part of the nineteenth century they were excessively purged, bled, and starved; later, as an alternative, they were treated with massive doses of nauseating antimony; and, still later, they were drenched with alcohol. The mortality was appalling, and by degrees it was recognized that treatment less dramatic and more imbued with common sense gave far better results.

Pneumonia is a self-limiting disease tending to recovery. In 100 cases the chances are that about 75 will survive if allowed to do so; 10 to 15 will probably die—doomed from the first. This leaves another 10 to 15 patients whose chances of recovery will depend on the manner in which the case is handled. The medical man is the determining factor in this small percentage of patients. Correct treatment and careful nursing are going to turn the balance.

For the last few years there has been an earnest endeavour to discover some treatment which might fairly be called "specific." Either a serum comparable in its results to the antitoxin for diphtheria, or a vaccine comparable to—what? I cannot fill in the blank. We are arrested by the peculiar fact that there is no acute infectious disease in which treatment by vaccines has a recognized and assured position. If vaccines succeed here, then pneumonia will be the first acute infection to be combated successfully in this way.

Prophylaxis.

Pneumonia is an infectious disease, and prophylaxis in regard to it obtains less consideration than it deserves.

In view of its contagiousness it is unwise to concentrate the pneumonias in a general ward of a hospital. In 1898 I made this mistake—in order to facilitate observation—with the unfortunate result that three of the other patients developed pneumonia.

When a patient suffering from pneumonia is nursed in a general ward he should be partially screened off from the adjacent patients. Sputum should be disinfected, as also clothing and other fabrics which have been contaminated by the patient.

Every nurse should be taught to hold a sheet of paper or cardboard, or a strip of gauze, between the patient's face and that of the examining doctor.

It is a good plan, when examining the right side of the chest, to see that the patient's head is turned well to the left, and vice versa. Otherwise the patient may, and often will, cough directly into the face of the doctor—which is not only unpleasant but clearly dangerous.

Hands should be washed after examining a patient, and always before food is taken.

Since the pneumococcus is liable to lurk in the mouths of those in attendance on the patient, gargling with milton or other antiseptic is advisable.

Finally, the room should be carefully scrubbed down and the bedding disinfected when the illness is over.

Prophylactic Vaccination.—This is no longer a matter for conjecture or uncertainty. Since 1911 the evidence has been accumulating, and the results of prophylactic inoculation in the mines of South Africa, instituted by Sir Spencer Lister, have proved that the subcutaneous injection of large doses of pneumococci has a specific effect, and greatly diminishes both the incidence of the disease and the mortality. The great value of prophylactic inoculation has been further demonstrated by Cecil, Austen, Vaughan, and others. How far this line of treatment is practicable in ordinary life it is difficult to say, but it is certainly advisable in the case of those nursing pneumonia, and also in the case of medical men, who in the course of their work are frequently and inevitably exposed to infection at close quarters. The risk of infection is then greatly lessened. The nature of the vaccine will vary to some extent with the prevailing type of infection.

Pneumonia has been aptly termed an "acute medical emergency," and from the onset (however mild in its earlier manifestations) it must be treated as a serious disease. While much more easily treated in hospital than in private, the essentials are the same.

In private you will be surrounded by anxious relatives and friends. The suddenness of the onset, the daily variations in the condition of the patient, give rise to fluctuations between hope and despair, and there is a general atmosphere of apprehension and dread. All this makes it difficult for the doctor to maintain a cool and balanced judgement. The tendency in such circumstances is to do too much, for the doctor is badgered and harassed by the relatives, many of whom well deserve the title of "Gawd-sakers," a term for which we are indebted to H. G. Wells, and with which he dubbed those whose refrain in any emergency is "For Gawd's sake let us *do* something"; and perhaps, overpersuaded, the doctor "does things" which he had far better have left undone. Alertness, self-confidence, and calmness are essential on the part of the doctor—the man responsible for piloting his patient.

The common cause of death in pneumonia, apart from complications, is cardiac or cardio-vascular failure, and it is agreed that the three important factors are: (1) toxaemia, (2) anoxaemia, (3) stress on the right heart, the result of the pathological changes in the lung.

* The introductory paper to a discussion in the Section of Medicine at the Annual Meeting of the British Medical Association, Edinburgh, 1927. Professor Lovell Gulland, President of the Section, was in the chair.

For treatment to be effective, therefore, these factors must be borne in mind from the first. The main essentials are fresh air and complete physical and mental rest. A quiet, cool, well ventilated room, with an open window—for fresh air is a tonic. A fire, but no fug. The bed should be single, the bed clothing light; there should be neither eiderdown nor dense counterpane. No gamgee jacket is required. A gamgee jacket is merely a sop to the mentality of the relatives and nurses.

The clothing should be loose and open down the front to facilitate examination. It is then easy to examine the major part of both lungs without disturbing or distressing the patient. With arms at rest on the pillow above the patient's head there is easy access to the axillae. After a diagnosis has been made this method of examination will suffice.

From the first the need for absolute rest must be impressed on those in attendance, and the use of the bed-pan, distasteful as it is to some, must be insisted on from the beginning. Every unnecessary movement should be avoided; energy must be conserved. The time to treat cardiac failure is before it has occurred. If, however, the patient is comfortable in the semi-prone position there is no reason why he should not lie partially propped up. Sometimes breathing is easier thus. Tepid sponging is soothing, and tends to ease and comfort, and is steadying to the vasomotor system.

A pneumonic patient is thirsty rather than hungry. He should have plenty of fluid, and in the first forty-eight hours fluid only; water, or natural lemonade containing glucose; diluted fruit juices, grapes, and one pint of milk in the twenty-four hours, well diluted. Tea or coffee may be given, but the coffee should not be allowed towards the end of the day. After the shock of onset (in a mild case) there is no objection to a somewhat less sloppy diet—such as a lightly boiled egg, purées, and a few dry biscuits. I question whether it is wise to give soups and broths.

At the onset the bowels should be freely opened. Calomel or salines, or a combination of both, are generally all that is required; if the bowels are stubborn, then a simple enema. This can be repeated when necessary, or a saline given each morning.

Abdomen.—Throughout the illness the condition of the abdomen must be carefully noted, and at the first indication of distension steps taken to afford relief. A distended abdomen hampers the diaphragm, and in emphysematous patients or those with old-standing mitral disease abdominal distension is a grave complication. If there is reason to suspect that the diet is responsible, then milk should be stopped, sugar diminished, a simple enema given, and, if necessary, a rectal tube inserted to remove colon flatus. If these means fail, an intramuscular injection of pituitrin should be given. An ice-bag to the abdomen is sometimes of service.

Specific Treatment.

We now come to consider specific treatment—treatment by vaccines or serums, or both; a line of attack concerning which there is undoubtedly considerable difference of opinion. For example, in the 1925 edition of Osler's *Medicine* we read that "There is no proof that the use of vaccines is of value in treatment." And in the article by Drs. R. A. Young and G. E. Beaumont contributed to the textbook edited by Dr. F. W. Price, the position is summed up thus: "Vaccine treatment is recommended by some, but the results are generally disappointing during the acute stage. Vaccines seem to be more valuable in cases of delayed resolution." This may be taken as fairly representing the views of the majority of the profession in regard to the use of vaccines in the treatment of pneumonia.

On the other hand, a large amount of careful work has been carried out which tends to show that, under certain limited conditions in definite types of the disease, vaccine treatment does shorten the illness, modify the severity of the attack, and diminish the mortality. In England Professor Wynn is well known for his enthusiastic advocacy of this form of treatment.

My personal attitude towards the therapeutic value of vaccines in pneumonia has been frankly critical. I looked upon pneumonia as a septicaemia in which there was, as a rule, a good marrow response with an adequate leucocytosis, and serum treatment (when feasible) appeared to be the line of attack most likely to give results. In addition, I was perhaps unduly influenced by the practical difficulty in determining the specific form of organism responsible in each patient, and the delay in preparing an autogenous vaccine.

Recent investigations, however, seem to indicate that pneumonia is a local infection in the lungs with only a tendency to septicaemia—in fact, a focal type of disease in which vaccines might be expected to prove beneficial, and aid in the more rapid development of antibodies. I was impressed by an interesting paper published by Captain Malone in 1925, in which he dealt with 58 cases of pneumonia—29 treated with vaccines and 29 as controls. He gave a dose of 400 million on the day of admission. This was a mixed vaccine containing Type 1 (one strain) and Type 4 (three to four strains). The sputum was typed the same day and a vaccine prepared from the peritoneal cavity of a young rabbit. The next day and the day following the patients received 400 million of homologous vaccine. The results were favourable and appeared to justify the following conclusions: (1) That early vaccine treatment proved effective in promoting recovery, lessening the duration of the fever, and assisted in ending the fever by crisis. (2) That vaccines after the third day proved ineffectual. This and other credible evidence cannot be disregarded.

All the advocates of vaccine therapy in pneumonia stress the importance of vaccination within the first three days. After the third day it is questionable whether anything is to be gained by this form of specific treatment.

Pure pneumococcal pneumonia with frank leucocytosis is not clinically comparable to the influenzal pneumonias, in which there is a tendency to poor or delayed marrow response, and a leucopenia rather than a leucocytosis. In these patients any treatment which will stir up the marrow is of benefit. Polyvalent serums, either antipneumococcal or antistreptococcal, protein shock, in whatever way produced, and vaccines, autogenous or stock, act in this manner. It is an open question as to how far this treatment is truly specific. This is a question for the bacteriologists.

It is in the leucopenic type of pneumonia that we should expect the best results from injections of sodium nucleinate—advocated by Dr. Gardner-Medwin—a drug which has proved of considerable benefit.

The use of vaccines or serums is attended by certain obvious difficulties, the chief being the necessity for the active co-operation of a good laboratory near at hand, for the type of the infecting pneumococcus and also the nature of any associated organisms must be determined rapidly.

If serum is used there is in addition the very considerable expense entailed. Serum is dear and, to be effective, large quantities must be injected every eight to twelve hours. There is the liability to anaphylactic reactions (Thomas records two deaths). Serum treatment is confined to Type 1 pneumonias, but since there were in England and Wales in 1915 something like 32,000 cases of this form of pneumonia, with 8,000 deaths, there is plenty of scope for its use. These are material disadvantages, and unless the results are incontrovertible I question whether the general practitioner is likely to be an enthusiastic exponent of serum treatment. These difficulties are met to some extent, so far as vaccine treatment is concerned, by the use of stock vaccines, prepared from fresh cultures representing the particular flora of the prevailing epidemic. The stock can be used for the first injections while the pneumococcus is being typed and an autogenous vaccine is prepared. If the autogenous vaccine is not used during the acute stage it may be of service later, if resolution is delayed.

In conclusion, Type 1 serum appears to have made good in the treatment of Type 1 pneumonia, and it is possible that it may be of benefit to patients suffering from other types. To be efficient it must be injected intravenously in doses of 100 c.cm. every eight hours, and this treatment must be started early.

The value of vaccines is not so assured. If they are to prove effective they must be given in the first three days and in massive doses. In practice this will generally mean the use of stock vaccines.

Symptomatic Treatment.

From specific we pass to symptomatic treatment, and *pain* is usually the dominant symptom. Pain is incompatible with physical and mental rest, and must be mitigated. Fixation of the lower part of the chest may be all that is required, but sometimes this cannot be tolerated. If the patient experiences relief when the lower chest is grasped and steadied by the doctor's hands, then strapping or firm bandaging should be applied. A mustard poultice or ice-bag often gives relief, but the most satisfactory method is that of a hypodermic injection of morphine, or a dose of tincture of opium, or other opiate, such as Dover's powder or omnopon. So long as the air passages are dry, morphine can be given without hesitation for the relief of pain. If morphine fails, as it may, I should not hesitate to follow the advice of Professor Wynn, and introduce 400 to 500 c.cm. of oxygen or air into the pleural cavity.

Insomnia is another dangerous symptom because of the resultant nervous exhaustion, and it is most important that sleep should be secured in the *early* days of the illness, before the condition is critical. Sleep must be obtained for excitable, nervous, and apprehensive patients. A cool quiet room and hydrotherapy tend to produce sleep, but may not suffice. If pain is the cause of insomnia, sleep will ensue when the pain is relieved. When in doubt, rather than risk a restless and fatiguing night, an opiate should be administered. An ounce of whisky or brandy, given as a hot drink with the opiate, has a definitely soothing effect, and may prove comforting to the patient. Paraldehyde in doses of 2 drachms with an equal amount of brandy, prescribed as an emulsion in peppermint water, is another satisfactory, although unpleasant, hypnotic. After the fifth day opium and its derivatives must be given cautiously, especially if there is undue secretion in the air passages. In the wild delirium, sometimes almost maniacal, which may occur at the crisis, there is of course no option. Morphine, alone or combined with hyoscine, is the only remedy.

Cardiac Failure.

From the first the management of the case is directed towards the prevention and treatment of cardiac failure. One factor in the production of cardiac failure is the *toxaemia* (always present, though in varying degrees), which impairs the functioning power and the integrity of the myocardium, hits the central nervous system, and interferes with vasomotor tone. A second important factor is *anoxaemia*. From various causes the blood flowing through the coronary arteries is deficient in oxygen. A third element is the stress on the right ventricle resulting from the pathological changes in the lung. *Distension of the abdomen*, with interference of the movements of the diaphragm, is a further factor which sometimes adds to the difficulties of the right heart.

From the onset, management of the patient is directed towards preserving the functional integrity and efficiency of the myocardium. Vasomotor tone is maintained by hydrotherapy. The depth of the respirations is increased by cool fresh air and the relief of pain. Physical effort on the part of the patient must be reduced to a minimum. Toxaemia must be met when possible by specific treatment, by careful attention to the bowels, to the intake of fluids, and to the action of the kidneys.

At the first indication of cyanosis the administration of oxygen should be instituted. It should be given continuously for an hour at a time, and the result noted. Oxygen is probably the best cardiac stimulant. The difficulty is to get oxygen into the blood; the usual methods are ineffectual, and more often act as a placebo to the relatives than as an efficient oxygenator. The funnel method is futile unless the funnel is large and applied close to nose and mouth. More efficient is a No. 10 catheter with three to four apertures, inserted into one nasal orifice after desensitizing the mucous membrane. The other nasal orifice should be blocked with cotton-wool or compressed by the nurse during each inspiration; nevertheless this method does not compare with the mask. My experience, however, is that patients will very rarely tolerate anything applied over the nose and mouth, especially if they are partially delirious.

Barach (*Arch. Int. Med.*, 1926, vol. xxxvii) has described an apparatus used by him with success—a glass nose-piece and rebreathing apparatus by which a 40 per cent. oxygen mixture in the nasopharyngeal air is obtained. Still better results followed the use of an oxygen tent. In his opinion, the value of oxygen is supportive and not curative. It tends to prolong life until such time as the immunity mechanism is able to accomplish recovery. The passing of oxygen through alcohol is merely foolishness. If there is considerable moisture in the air passages it is well to combine the administration of oxygen with hypodermic injections of atropine.

Digitalis.

There is no agreed opinion as to the value or the effect of digitalis in pneumonic patients, except in those in whom fibrillation existed before the onset, or when it originates during the infection. It is obvious that if pneumonia is superimposed on fibrillation the fibrillation must be controlled by digitalis, and the control maintained; a daily total of 45 to 60 minims of the tincture or other adequate preparation must then be given from the first. Fibrillation occurring during the course of the illness must be treated in the same manner. If no member of the digitalis group has been exhibited before the onset of the fibrillation, then I should not hesitate to give an intravenous injection of strophanthin; but my experience is that this toxic form of fibrillation—especially in the influenzal type of pneumonia—does not respond satisfactorily to digitalis and its allies.

In an interesting communication by Levy (*Arch. Int. Med.*, September, 1923) it was shown that the tendency to dilatation of the heart in pneumonia was demonstrably lessened by adequate doses of digitalis. He was dealing with hearts whose fundamental rhythm was normal. It has also been shown that digitalis has a favourable action on the efficiency of the heart, irrespective of alteration in the rate. The contractility is increased.

I believe we are justified in looking upon the routine exhibition of digitalis as of value. To be efficient it should be given from the first in adequate doses—from 45 to 60 minims of the tincture in each twenty-four hours. In the short period covered by an acute pneumonia it is unlikely that any toxic effects will be produced with the above doses; nevertheless, careful supervision is essential, and by the fifth or sixth day the dose may require modification.

The Administration of Alcohol.

The general public still has implicit faith in alcohol as *the* cardiac stimulant, and it is evident that there are some members of our profession who even now believe that alcohol in some peculiar way—in its specific action—increases the efficiency of the heart. In a recent textbook in the section dealing with pneumonia I find the following: "Alcohol is often useful; it should not be given too early in the attack, but where there are indications of incipient cardiac weakness 4 to 6 oz. daily may be given, and this even to alcoholics." Four to six ounces of *alcohol* in twenty-four hours is no mean dose.

So far no scientific evidence has been advanced in favour of the view that alcohol, in its specific action, is a direct cardiac stimulant, and I am convinced that the prognosis in any particular patient is rendered graver by repeated doses of alcohol administered to prevent or counteract cardiac failure. Like most other medical men of my age, I was trained to prescribe alcohol freely at the first indication of cardiac weakness, and it was not for some years that, as the result of clinical observation, I began to question the value of this line of treatment.

In the years 1899 to 1901, while resident medical officer in a large union infirmary, I made a careful and serious attempt to determine whether pneumonia patients did better with or without the administration of alcohol, and careful notes were kept of 150 cases. Forty-seven were treated without alcohol; 103 received alcohol when

the ordinarily accepted indications for its use arose. The patients in each section were of the same type, and they were drawn from the same districts of the city. On certain days of the week every case of pneumonia admitted passed into the first group. On the remaining days the pneumonias were drafted into the other group. In this way, if there was a variation in the severity of the prevailing infection, both groups were affected equally.

The results were remarkable. They left no doubt in my mind that alcohol, given to fortify and strengthen the heart, failed in its purpose, and instead of helping the patient to fight his infection materially diminished his chances of recovery.

In Section 1, treated without alcohol, of the 47 patients 14 died—a mortality of 29.5 per cent. In Section 2, of the 103 patients 47 died—a mortality of 45.5 per cent.; a difference of 16 per cent. The average age in each group was 35 years.

I thought that this remarkable difference in mortality might be due to a relatively greater number of moribund patients being admitted into the second section, and in order to eliminate that factor I deleted all those who had died within twenty-four hours of admission. I found that 5 moribund cases were included in Section 1, and 16 in Section 2. The revised figures, after deducting those patients moribund on admission, are as follows:

Section 1.—42 cases with 9 deaths—a mortality of 21.4 per cent. Average age 34 years.

Section 2.—87 cases with 31 deaths—a mortality of 36.8 per cent. Average age 32.8 years—on the whole a younger group.

We find a difference of 15 per cent. in the mortality remaining after the elimination of those moribund; the two sections having, for all practical purposes, the same average age.

I do not wish to stress unduly the actual figures. There were possibly some unrecognized factors responsible, in part, for the lowered mortality in Section 1, but in view of the fact that the only material difference in the treatment of the two groups was in the administration or the withholding of alcohol, I consider it reasonable to assume that this was at any rate the dominant factor.

Further experience has convinced me that alcohol is only of use to pneumonic patients under certain well defined conditions, and that it is not only futile, but detrimental, when administered in repeated doses to help a failing heart. It may be of service, either alone or in combination with other sedatives, in procuring rest and sleep during the acute stage of the disease. It may be comforting, given in a hot drink during the initial rigor, and no objection could be taken on therapeutic grounds if alcohol in some palatable form were ordered during convalescence. But to give alcohol in the belief that it is a cardiac tonic or stimulant is opposed to scientific teaching and clinical experience.

One most important action of alcohol in the blood stream, and an action generally overlooked, is its effect on the immunizing response of the body. Recovery, in pneumonia, depends on the production of antibodies, and alcohol has been proved to inhibit this vital activity on the part of the organism.

Professor Wynn sums up this aspect of treatment tersely when he says: "No proof has yet been advanced that alcohol is of service in cardiac failure, and to give, under the guise of a stimulant, a depressing drug which, moreover, inhibits the immunizing process, to patients who are unable to neutralize its effect, cannot be sound treatment." With this I agree.

I have already mentioned the value of glucose taken by the mouth, and there is an increasing volume of evidence in favour of administering it by the intravenous method: 250 c.cm. of a 10 per cent. solution of glucose in normal saline is injected every eight hours, or at longer intervals if considered necessary. Glucose is a valuable heart food. The injections tend to fortify the heart and incidentally soothe and comfort the patient. Another method of administration—easier, though of questionable efficiency—is that of adding glucose to a saline enema.

A material drop in the blood pressure is of serious moment, and indicates failure in the cardio-vascular apparatus. In such circumstances pituitrin, 1/2 to 1 c.cm., should be injected every four to six hours, and an ice-bag applied to the abdomen.

Prigge (*Deut. Arch. f. klin. Med.*, 1922, April 18th) has used intravenous injections of hypertonic saline in the critical periods. He states that 100 c.cm. of 25 per cent. salt solution raises the blood pressure 15 to 35 mm. of mercury, and that this rise is maintained for about six hours.

Caffeine is a direct cardiac stimulant, and also stimulates the vasomotor centres. It can be administered as strong coffee, as caffeine, or the citrate, and there are several preparations on the market for hypodermic injections. If the patient is restless, or has difficulty in sleeping, it is wiser not to give coffee in the late afternoon or evening.

In *strychnine* we have another drug very widely employed and with a reputation beyond its merits. Hypodermic injections are commonly given in the belief that the strychnine is a direct cardiac stimulant. There is, however, no evidence that it has any specific action on the heart. It acts rather on the respiratory and vasomotor centres, and in this way may prove of service in the latter days of the disease.

Venesection is occasionally of value. It will temporarily relieve the heart in the first few days, when the right ventricle is struggling to adapt itself to the mechanical difficulties imposed upon it by the rapid consolidation of lung tissue. Later on, engorged jugulars, an increase of the cardiac dullness to the right, and marked cyanosis would justify blood letting. The relief is only temporary, and is of value in so far as it enables energetic measures to be instituted for the salvage of the cardio-vascular mechanism.

Probably *ammonium carbonate* is more commonly prescribed in pneumonia than any other drug. Its action is that of a carminative, a respiratory stimulant, and an expectorant; its chief value is when there is free bronchitic secretion, embarrassed breathing, and increasing cyanosis It is of questionable value in the first few days unless there is an associated bronchitis. Fairly large doses should be administered, such as 10 grains every two hours, followed by a hot drink and a definite attempt on the part of the patient to expectorate.

There are other lines of treatment which have had a vogue, and other drugs from which benefit is said to accrue. To mention a few: potassium iodide and creosote, preparations of quinine, calcium chloride, barium chloride, camphor, and diathermy. In practice the wise man uses few drugs and understands their action and their dosage.

In the discussion which follows I would suggest that attention be directed more particularly to the larger issues. Let us pool our experiences in regard to the efficiency and practicability of specific treatment, serums and vaccines; the value of alcohol; the indications for morphine and digitalis; and the best methods of administering oxygen. Along such lines a discussion must prove of exceptional value.

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II.—THE VACCINE TREATMENT OF ACUTE PNEUMONIA.

BY

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APPARENTLY the chief obstacle to the general employment of vaccines in acute infections, such as pneumonia, is the fear of obtaining a reaction—a phase of lowered immunity—which might harm the patient. It is not sufficiently understood that a reaction only occurs in a person who is sensitized, whose cells are allergic. This state of sensitization is due to the presence of specific antibodies. If these antibodies are absent there is no sensitization, and it is impossible for a reaction to occur. We see this clearly in tuberculosis. It is quite safe to inject a whole cubic centimetre of old tuberculin into an uninfected infant who has had no experience of the infection, whereas a tuberculous adult may react to the one hundred-thousandth of a cubic centimetre.

Specific antibodies are present in all states of chronic infection, and therefore reactions are easily produced in chronic bronchitis, asthma, chronic arthritis, chronic septicaemias, unresolved pneumonia, and so on. In acute infections they are only present after a certain interval has elapsed, as the process of their formation is comparatively slow. It is this interval after infection and before sensitization that affords us the opportunity of intervening safely with an injection of a fairly large amount of vaccine without fear of producing a reaction.

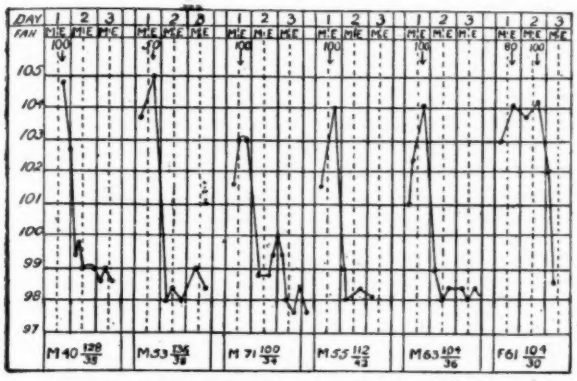

CHART 1.—Lobar pneumonia. Inoculated on first day.

In pneumonia the curve of intoxication probably rises rapidly and then remains fairly steady, corresponding roughly with the temperature chart. At first antibodies are absent, but about the fourth day they begin to be present; the rise of their curve is at first slow, then rapid, and about the end of the week the antibody curve overtakes the curve of intoxication and a crisis occurs. The problem is to produce an early rise in antibodies while the curve of intoxication is still ascending and easy to overtake, and before the toxins are fixed in dangerous amount in the nerve and heart cells. There is an interval in which the patient is unsensitized, and it is found, as a matter of experience, that if during that interval we inject an adequate amount of a suitable vaccine we can to a large extent control the infection. It is obvious that the earlier the injection the more successful the results should be.

The first action of the vaccine appears to be a non-specific one; it is far too rapid for the production of specific antibodies, which appear as an after-effect.

For acute lobar pneumonia I use a stock vaccine of pneumococci made from primary growths under twenty-four hours old. The vaccine contains several strains, but it is more important that it should be an active vaccine from virulent organisms. For an adult at least 100 millions should be injected, for a child aged 12 half the dose, and a child aged 3 or 4 a quarter. As at present true lobar pneumonia is comparatively infrequent, and the majority of cases we see are broncho-pneumonias of mixed infection, I use a vaccine containing equal parts of pneumococci, streptococci, and *B. influenzae*, 100 million of each.

In either case the important thing is to inject early. I would urge that pneumonia be regarded as an acute emergency, demanding as prompt action as an acute surgical emergency such as a perforated ulcer. Our plan should be "strike early and strike hard." It is a great advantage of vaccine treatment that a stock vaccine can always be at hand and injected at once. The object is to control the infection as soon as possible after its onset and so prevent dangerous intoxication. After the toxins are fixed in the cells the issue is out of our hands. If injected within the first twenty-four hours after the initial rigor it is my experience that in the majority there is a fall of temperature combined with general improvement during the following twenty-four hours. The earlier the injection the more certain the result. If the first injection fails we can repeat the vaccine every twenty-four hours.

The charts show the results of injection on the first, second, and third days respectively. The first chart is that of a man, aged 40, who was injected three and a half hours after his rigor. He already had blood-stained sputum,

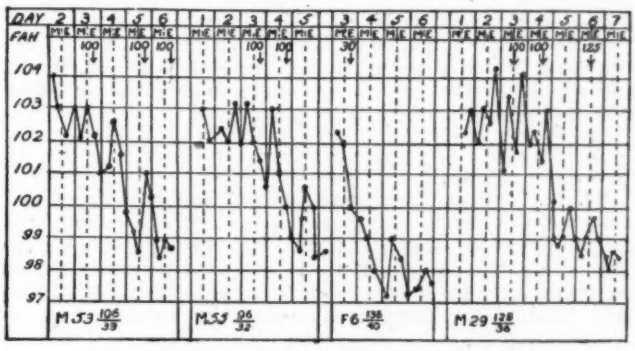

CHART 3.—Lobar pneumonia. Inoculated on third day.

pain in the side, grunting respiration, a temperature of 105°, and a respiration rate of 38; 100 million pneumococci were injected. The temperature steadily fell and reached normal in sixteen hours. For a few days he had consolidation of both lower lobes with a complete absence of symptoms.

The second is that of a man of 53 seen one evening. A rigor had occurred in the morning; his temperature was 105°, respirations 36, and pulse 136. There were early signs in his right lower lobe. He received an injection of 100 million; his temperature fell and in the morning was normal, with a pulse rate of 68, and respirations 20. He was out of bed in a week and at the seaside in a fortnight.

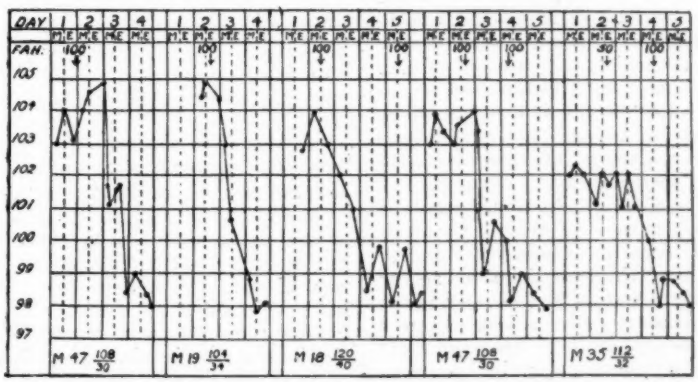

CHART 2.—Lobar pneumonia. Inoculated on second day.

Again was seen the striking phenomenon of a man with a portion of his lung solid, and yet a complete absence of symptoms. The vaccine appears to hasten consolidation, which is a protective reaction, and it also quickens resolution.

The charts of patients injected during the second day show a similar result, but a second injection is more often required. When injected on the third day the fall of temperature is usually more gradual and more than one injection is required; when injected first on the fourth day again the fall is more gradual and crisis is less easily obtained.

The results in 100 consecutive patients were that 49 were injected during the first three days; of these only one died. This was a pregnant woman who had been a chronic asthmatic and was confined forty-eight hours after the onset of pneumonia. Of 51 injected after the third day 12 died. This shows the importance of treatment before dangerous intoxication has occurred.

Of patients injected during the first day, 83 per cent. had a normal temperature in twenty-four hours and 100 per cent. in forty-eight hours. Of those injected on the second day, 57 per cent. had a normal temperature in twenty-four hours, 93 per cent. in forty-eight hours, and 100 per cent. in seventy-two hours, whereas of those injected for the first time on the third day only 20 per cent. had a normal temperature in twenty-four hours, 60 per cent. in forty-eight hours, and 73 per cent. in

seventy-two hours. I think those figures again show the importance of early treatment.

I have some charts of influenzal pneumonia injected on various days which show the same influence of a vaccine in shortening the duration of the disease.

Apparently Professor Hay holds that if vaccines prove to be successful in pneumonia it will be the first instance of the success of vaccines in acute infections. On the contrary I hold that acute infections offer the most brilliant examples of successful vaccine therapy; its use in pneumonia is merely an application of a general principle—that any acute bacterial infection for which an appropriate vaccine can be prepared, and which can be treated early, may be aborted by timely injection.

In vaccine therapy, therefore, I consider that we have a weapon which can be applied promptly and effectively, and which, if used on a large scale, would help to reduce the very high mortality from pneumonia.

DISCUSSION.

Dr. H. MORLEY FLETCHER (London) endorsed Dr. Hay's condemnation of the gamgee jacket. He thought that morphine could safely be given, if necessary, during the first three, or perhaps four days, but afterwards should be withheld unless there was some urgent indication for its use. One of the dangers attending the use of morphine in the later days of the illness was meteorism; he had seen this occur with fatal results on several occasions shortly after the administration of the drug; the sudden abdominal distension increased respiratory embarrassment. The deleterious action of alcohol on the cardiac muscle was recognized and also the fact that it might act as a cell poison, but it should not be withheld indiscriminately in pneumonia, which was an acute illness of short duration; there was no direct evidence that a moderate dose of alcohol given for a few days could affect the heart muscle to any serious extent. It promoted sleep and also might be of considerable use at the crisis in cases exhibiting signs of collapse which so often accompanied the fall of temperature. He did not consider alcohol in any form necessary for young adults in the absence of special indications. The treatment of pneumonia by diathermy, recently advocated by Eaton Stewart, should be thoroughly investigated. Sodium nucleinate had been recommended by Gardner-Medwin in cases of pneumonic patients exhibiting a leucopenia or low leucocyte count. It had been claimed that injections of this drug given on one or two successive days stimulated leucocytosis and were followed in forty-eight hours by crisis. These results by Gardner-Medwin had not been confirmed by Dr. Morley Fletcher's investigations of cases of lobar pneumonia or of other infective conditions. The clinical evidence of anoxaemia was cyanosis, but in some cases of pneumonia increasing pallor might take its place. Cyanosis and rapid breathing might be present before the signs of consolidation appeared. The best therapeutic measure for combating anoxaemia was oxygen, but it was usually given too late in the course of the disease or as a last resource when all hope had been abandoned. He thought that oxygen was the most valuable agent available for the treatment of pneumonia, but it should be given early, systematically, efficiently, and in sufficient quantity. In the case of adults it should be administered more or less continuously as soon as the diagnosis was made. Oxygen lessened the anoxaemia and so reduced the risk of cardiac collapse; it was also a cardiac stimulant, and had a marked effect in calming delirium and promoting sleep. It had been suggested that the delirium of pneumonia was due to unoxidized toxic bodies in the circulation, and this might be some explanation of the calming effect of oxygen on delirious patients. In his opinion the intranasal tube was the most useful method for the administration of oxygen, as it was efficient and easy to manage. It was first employed in Edinburgh in 1910 by Thomson and Dunlop. It was a method which could be used for infants with great facility. There had been much discussion as to the value of digitalis in acute febrile conditions, especially lobar pneumonia. The high pulse rate in pneumonia was not necessarily an indication of cardiac failure, but was due chiefly to the action of toxins on the cardiac centre. Digitalis did not lower the pulse rate in these circumstances. Later, when the heart muscle began to fail, digitalis might be of great value, and there was no evidence that its action then was different from that produced in non-febrile failure of heart muscle. Cardiac failure in pneumonia might be recognized by increasing rapidity of pulse and the onset of irregularity due to auricular fibrillation. A further indication was the progressive fall of blood pressure. These signs of cardiac failure should be treated in the same way as when they occurred in non-febrile conditions—namely, by digitalis. Unfortunately they might manifest themselves suddenly, without warning; it was then too late to administer digitalis, as the time left was too short for its action to be exerted. In these circumstances strophanthin given intravenously and repeatedly was the best substitute. For this reason he held that it was advisable in a case of pneumonia in an adult to administer digitalis (preferably as the tincture) as soon as the diagnosis was made. There was no satisfactory evidence against doing so, and the advantage to the patient at a later stage might be very great—in fact, it might determine the issue of the battle.

Professor R. J. S. MCDOWALL (London) dealt with the methods for the relief of the heart from the physiological aspect. The heart had two loads: (1) it had to force out blood against diastolic pressure, (2) it had to pump out the blood which filled it at the end of diastole; in pneumonia the load at the end of diastole might be appreciably in excess of normal. Conditions which raised the carbon dioxide contents of the blood tended to raise the venous pressure; in health the heart responded by increased force and rate of the beat, but when the heart was poisoned there was the possibility that it might be filled with more blood than could be pumped out. Cardiac tonics, although assisting the heart, might also hamper it by constricting the blood vessels and so increasing the work the heart had to do. The most physiological method of relieving the heart was by bleeding, and as the high venous, and possibly a high pulmonary, pressure was partly responsible for the cardiac failure there was much to be said for bleeding before the actual stage of failure was reached. It had been objected that the effect on the arterial pressure was only temporary, but what happened was that the arteries became constricted to keep up the arterial pressure; the venous pressure fell in consequence, and the fall was prolonged. The fall was accompanied by a reduction in the viscosity of the blood, and these two factors must relieve the heart appreciably. There was also evidence that the blood had an increased bactericidal power after bleeding. Alcohol was a drug which reduced venous pressure; although it might have little or no action on the isolated heart there seemed to be no doubt that in the intact animal it did cause a fall in this pressure. Adrenaline might be tried in the treatment of the shallow respiration which was partly responsible for the faulty aeration of the blood. The shallowness was thought to be due to an exaggeration of the Hering-Breuer reflex, and he had recently found experimentally that adrenaline had a distinct action in abolishing this reflex.

Dr. STANLEY DAVIDSON (Edinburgh) put in a strong plea for serum treatmeht, though he could not give any figures obtained in this country in support of his plea, as it had never received a serious trial, but the indirect evidence obtained by experiment and the direct evidence of the results obtained at the Rockefeller Institute were overwhelming. The clinician might obtain great help from a trained bacteriologist; films of sputum showing great numbers of pneumococci and positive blood cultures persisting after the onset of the disease were of bad prognostic significance.

Sir JAMES BARR said that it would often be much better to consider the treatment of the patient suffering from pneumonia rather than the treatment of the disease. The mortality would probably always be rather high owing to failure of the defensive mechanism. Prevention was better than cure, and if half the money spent on the prevention of tuberculosis were devoted to the simpler problem of the prophylaxis of pneumonia there would be a different result. The drawback to vaccine prophylaxis

was its short duration, but even a short immunity was a decided gain. If the severe chill in the early stage was recognized and dealt with promptly and efficiently an attack of pneumonia might be warded off. An important point in treatment was to get as many free calcium ions into the blood as possible and to avoid decalcifying agents.

Dr. A. F. HEWAT (Edinburgh) expressed his strong belief in the value of alcohol in the treatment of pneumonia. He said he would feel greatly handicapped in dealing with any case of pneumonia if he knew that alcohol must be withheld.

Dr. F. M. GARDNER-MEDWIN (St. Asaph) described some of his results with sodium nucleinate. He had found that all types of lobar pneumonia responded to a single dose of sodium nucleinate, the pneumonic process being terminated in forty-eight hours after its administration. This result was independent of the period of the disease at which the drug was given. The first cases Dr. Willmore and he had treated were cases of heliotrope cyanosis with high fever and delirium; such patients ordinarily all died, but with sodium nucleinate they recovered. Professor Hay had stated that probably 10 to 15 per cent. of all pneumonia patients were doomed from the first to die; Dr. Gardner-Medwin believed that an intramuscular injection of sodium nucleinate, with plenty of soda glucose lemonade, would save 90 per cent. of these "doomed" cases.

THE INFLUENCE OF INTERNAL SECRETIONS ON SEX CHARACTERS.*

BY

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THE sexes are to be distinguished by differences in details of structure and of function, and maleness and femaleness can be defined. For purposes of discussion it is convenient to classify the sex-dimorphic characters as (1) primary genotypic, (2) secondary genotypic (including the primary gonadic), and (3) secondary gonadic. In the establishment and maintenance of this sex-dimorphism the component members of the endocrine system, it has long been recognized, play a most important part. That this is so is illustrated in the following aphorisms, which in their sequence show the historical development of the modern point of view. "Propter solum uterum mulier est, quod est." "Propter solum ovarum mulier est, quod est." "Propter secretiones internas totas mulier est, quod est."

There is no difficulty in demonstrating that the physiological activity of the gonads is a condition of the normal development and maintenance of such of the sex-dimorphic characters as are secondary gonadic, since by definition these are such as are dependent upon the gonad. The criterion of a secondary gonadic character is that it reacts to the physiological activity of the gonad in a particularly definite way. It is established that the gonadic influence punctuates the growth of the long bones, thereby affecting the general proportions of the body; that it influences the development and the functioning of the central nervous system and affects the processes of general metabolism. But in addition, and especially, the physiological activity of the gonads exerts a strong and definite influence on certain structures and functions which constitute the commonly and readily recognized sex-dimorphic characters.

The intimate and significant relation between gonad and secondary gonadic characters is revealed by the results of (1) gonadectomy, (2) gonad implantation, and (3) administration of prepared products of the gonads.

Gonadectomy.

Castration of the newborn male rat is followed by a non-development of the genitalia, but has no effect upon general development. Since there is a sex-dimorphic difference in growth rate, and since orchidectomy does not affect general development, it would seem that growth rate is dependent upon sexuality—that is to say, is a secondary genotypic character, but that it is not a secondary gonadic character. However, it is more probable that the male-type growth rate of the castrated rat is due to the after-action of the gonadic hormone. In the case of the female the ovary does not function during the antepubertal period. This can be demonstrated by injecting ovarian extract or by implanting adult ovary into the immature female, when rapid growth and differentiation of the genitalia ensue, though only in cases in which these have already attained a certain stage of growth.

The effect of castration varies according to the age at which the operation is performed. Following pre-pubertal orchidectomy (later than in the case of the newborn) the genitalia do not develop normally—penis, vasa deferentia, seminal vesicles, and prostate remain incompletely developed and of small size, though the corpus cavernosum attains its full development. In the human the beard does not grow until, in old age, the castrate develops one similar to that of the aged female; the hair in the regio pubis comes to a horizontal base line, whilst the chest, axillae, and the extremities remain hairless. The localization of subcutaneous fat is characteristic, much accumulating in the gluteal region, under the breast, in the trochanters, on the mons veneris, and on the lateral aspects of the upper eyelids. The zone of proliferation of the epiphyses of the extremities persists even to the age of 35, so that the castrate attains a relatively greater height with disproportion of the body. The pelvis remains infantile, as does the larynx. The pituitary commonly undergoes enlargement, so that the sella turcica is increased in dimensions. Erection and cohabitation remain possible for a considerable time in some cases. The general intelligence is not obviously affected, but general apathy is characteristic.

Post-pubertal orchidectomy is followed by a non-development or a disappearance of the beard and a change in the regional distribution of the body hair, and a localized disposition of subcutaneous fat. The larynx becomes small and the voice high-pitched. Sexual libido may persist for some time, but ultimately disappears.

Ovariotomy in the human is performed late in life, and the sequelae are therefore not well marked. Atrophy of the genitalia takes place, especially of the vagina and the uterus. A marked accumulation of fat and an increase in body weight occur. Generally there is a decrease in the size of the breasts and in sexual libido. In some cases ill defined psychical disturbances follow.

The evidence derived from the results of gonadectomy points to the conclusion that the development and maintenance of many morphological, physiological, and psychical characters are dependent upon the integrity and functional activity of the gonads. The gonads affect not only the components of the accessory sexual apparatus, but also such sex-dimorphic characters as the regional distribution of the hair and the pitch of the voice. Metabolism is significantly reduced—that of fats particularly, that of carbohydrates less so, and that of proteins not at all. Following gonadectomy the neat interrelationship of the members of the endocrine chain is disturbed, and certain of the effects of gonadectomy may be but secondary to the indirect effects of this operation upon some other member or members of the endocrine system. It is seen that the effects of gonadectomy upon the sex-dimorphic characters vary according to the time at which the operation is performed in relation to the time of attainment of sexual maturity, pre-pubertal gonadectomy resulting in non-development of the genitalia and secondary gonadic characters, whilst the effect of post-pubertal gonadectomy is in inverse ratio to the age of the individual at the time of operation.

There is no satisfactory evidence which supports the conception that gonadectomy not only leads to the disappearance or atrophy of homologous sex characters, but also to the appearance of the heterologous. The apparent swing of the characterization of the castrated male in the female direction is to be explained more simply on the assumption that there is an agonadic full-grown form, that the female sex-characterization is nearer to this than the male, and that after gonadectomy there is a tendency on the part of individuals of either sex to swing towards the agonadic type.

* The opening paper of a discussion in the Section of Physiology and Biochemistry at the Annual Meeting of the British Medical Association at Edinburgh.

Gonad Implantation.

It is recognized that removal of the gonads is followed by a definite train of events, and it is reasonable to assume that the phenomena which follow gonadectomy are caused thereby. If this is so, then it may be assumed that the successful and timely implantation of appropriate gonadic tissue should result in the restoration of normal sexuality in the case of the agonadic individual, and implantation generally should be followed by phenomena which can be regarded as the effects of this procedure.

There is no difficulty in demonstrating that complete maleness and femaleness cannot be assumed and cannot be maintained in the absence of normally functioning pituitary, thyroid, adrenal, and so forth, but these endocrine glands stand in a different relationship to sexuality from that which the gonad occupies. Extirpation or disease of any of these in the mammal leads to the establishment of a distinct pathological condition, which can only be repaired by the restoration to the general economy of the disfunctioning or absent tissue. Gonadectomy, on the other hand, does not result in a diseased state: the individual becomes altered functionally and structurally, but the change is not so far removed from normality as to constitute disease. The gonads are especially concerned in the development and maintenance of sexuality, and it can be stated that the secondary gonadic characters, which are the most prominent of the sex-dimorphic characters, develop only when in an otherwise healthy body the gonads are functionally normal and active.

It is abundantly established that an animal which is castrated at an early age, and into which at the time of this operation its own testes or those from another animal from the same or from a nearly related species are successfully implanted, will develop normally in respect of the somatic functional and structural sex characters. The prostate, seminal vesicles, and penis in such animals develop so as to remain unexceptional. Partial or almost complete restoration of maleness is possible even in older animals castrated in early life, and the degree of restitution varies with the age of the individual at the time of castration and at the time of implantation, and with the length of the interval between the operations.

It is equally possible to restore femaleness in an individual previously ovariotomized by implanting ovarian tissue, and to prevent the sequelae of ovariotomy by implanting the individual's own ovary or that of a similar or nearly similar biological form at or about the time of ovariotomy. In such cases the uterus does not atrophy, or it increases in size again, and in the human the menses return.

It is established that it is possible to feminize a male by castration and subsequent implantation of ovarian tissue. The latent homologous sex characters—for example, the mammary gland—are stimulated into activity, whereas the heterologous—for example, the penis, prostate, seminal vesicles—remain underdeveloped, or become diminished in size and complexity.

It is established that it is possible to masculinize a female by ovariotomy and subsequent implantation of testis. The uterus and mammae remain undeveloped or shrink, whereas the clitoris increases in size to such an extent that it resembles the male copulatory organ. It seems fairly clear, therefore, that ovarian and testicular hormones are sex-specific, acting only upon those structures with which each is normally associated. It may be, however, that for genetic reasons female tissues—that is, such as are genetically female—respond preferentially to the hormone of the ovary, whereas genetically male tissues respond preferentially to that of the testis. It is established also that the sex-hormones are not specific for each biological form of animal.

It is established that it is eminently possible to produce an artificial hermaphrodite by combining in one and the same body both kinds of gonadic tissues. A male with a normally functioning sex-equipment can, following successful ovarian implantation, come to possess well developed mammae, and a female with a perfectly functioning reproductive system can harbour a testis graft which can proceed to spermatogenesis. Similarly, hermaphrodites can be produced through implantation of testis and ovary into an agonadic individual.

It has been recorded that such experimentation is followed by the development of bisexuality in respect of the psychical characters, but this has not yet been finally established.

In the case of the human, gonad implantation has been performed to "jockey" the individual's own gonads into a greater and more efficient activity, or to repair the agonadic condition. Many such operations have been attended with success, while others have not. Failure is probably due to imperfect technique, and to lack of a precise knowledge concerning the conditions within the body which are pre-requisite to successful implantation. Heterotransplantations have not been very successful, and it is probable that in these cases failure is due to an athreptic immunity, the host being unable to provide the implant with appropriate nutritional conditions. It is established, however, that testicular grafts from certain anthropoids can survive in the human body for many months, possibly even for years, and that the implants can exhibit a normal hormonic activity.

Such experimentation as this confirms the view that in the mammal one and the same somatic structure reacts differentially to ovarian and to testicular hormones. This may be due to the fact that the hormones are different while the soma of the two sexes is the same, that the hormone of the ovary is the same as that of testis while the soma of the male is different from that of the female, or that both hormone and soma are different in the two sexes. It is probable that the last view is the correct one.

Injection of Gonadic Tissue and Extracts.

The results of injection have been conflicting. Definite effects upon the circulation, metabolism, nervous system, and on the sex-dimorphic characters have been recorded, but in the main they have been effects which can be obtained by injection of extracts of animal tissues of all kinds, being characteristic of the action of proteins generally and not of gonadic tissue in particular. The effect of the extract must vary with the method of preparation and with the technique of administration. Moreover, it is not easy to reproduce the relation of gonad and soma by injecting gonadic material, particularly if such an organ exhibits a rhythm in its functioning, and if a quantitative action is involved. Though the evidence derived from injection methods is confusing, it can be said that this is due to imperfections in the methods of preparation and administration, and that there is nothing in this evidence which contradicts the point of view that the gonads, in their physiological functioning, direct the differentiation, and ensure the maintenance, of many of the sex-dimorphic characters.

The part played in sex-differentiation by the gonads and other endocrine glands is well illustrated in cases of spontaneously occurring or experimentally produced abnormality of the reproductive system. For example, the individual with abdominal testes is infecund but not impotent, and the penis, prostate, seminal vesicles, and all the secondary gonadic characters develop normally. In its behaviour the male exhibiting cryptorchidism is hypersexed. Similar results follow double vaso-ligation and vasectomy and *x*-irradiation of the testes. In the case of the ovary also it has been established that the gonad exerts its action upon the soma even after the gametogenetic function is in abeyance or destroyed.

The action of the gonad is demonstrated in cases of intersexuality. In the human there are clinical records of cases in which a periodic change in the psycho-sexual characters was to be noted both in males and females. Several hypotheses have been advanced to account for this. According to one, the soma is perfectly ambivalent, but there are two forms of that particular gonadic tissue which is responsible for the elaboration of the specific sex-hormones. There is a physical basis for the female sex-hormone and another for the male. An individual may find himself or herself equipped with both kinds in the gonads or even with the kind appropriate to the other sex. Normally only the more potent of the two sex-hormones exerts its action, but physiological disturbances may upset the balance, and the other kind of sex-hormone will then exert its effects, and so with such characters as are capable

of responding to this fresh stimulus, transformation in characterization can become evident. It is to be expected that the psychic characters, being more labile, will indicate this change more quickly and more thoroughly than will the morphological characters, which lose their plasticity much earlier.

Another hypothesis suggests that the soma itself can be intersexual for genetic reasons, and that under these conditions the normal hormone elaborated by the normal gonad is not sufficiently potent to guide the differentiation of the sex somatic characters into a state of maleness or of femaleness. For genetic reasons also the gonad itself may be intersexual, and it has been suggested that if this were the case the cure for homosexuality might well be implantation or injection of gonadic material. Such treatment has been practised. For example, the testes of a homosexual man have been removed and those of a normal individual implanted, with, it has been claimed, remarkable success. Other cases have not been successful. Such evidence as exists, however, permits one to assume with reason that many cases of homosexuality are due to some endocrine disharmony, though not necessarily a disharmony of an intersexual kind. In other cases it is by no means impossible that external agencies are responsible for the homosexual condition.

Medical literature includes many records of individuals in whom about the time of puberty a change of sexual characterization occurred. Commonly the case refers to an individual who, in early life, was with reason regarded as a female, yet who later developed many of the typical male characters. Many such cases have been shown to be instances of masculinization of a female by a hypernephroma. Similar adrenal neoplasms in the male have led to precocious sexual development, and, it is recorded, to advanced feminization. It is of importance to note that in these cases the effect of adrenal disfunctioning is only evidenced in the presence of the gonad. In other cases intersexuality has been found to be associated with the presence within the body of both ovarian and testicular tissues. This condition is in every way equivalent to that of experimental hermaphroditism produced in the guinea-pig and other laboratory animals.

There is yet another type of intersexuality which apparently is due to a different cause. In these cases the gonads are testes, usually intra-abdominal, but sometimes lying within the inguinal canals or subcutaneously; the accessory sex-apparatus consists of well developed derivatives of both Müllerian and Wolffian ducts, uterus, vagina, vasa deferentia, sexual vesicles, and prostate being present; whilst the external genitalia range in their form from that of an unremarkable vulva and clitoris to that of a grossly abnormal male with hypospadias and cleft scrotum. In those cases in which the external genitalia are of the female type the individual is regarded as a female. In all cases, however, with development and growth there comes the assumption of typical male characters—growth rate, voice, and regional distribution of hair, whilst the psychic characters in the case of the intersexual human are confused through treatment. Such are the cases of young "women" who become "men."

It may be that these are really females genetically in which ovarian tissue existed in the earlier stages of development, but in which this disappeared to give place to testicular. It may be that these are instances of hermaphroditism in which the ovarian tissue undergoes removal. But it seems more reasonable to regard them as genetic males in which the appearance of the physiological activity of the testes was for some genetic reason delayed, so that the growth of the rest of those structures which constitute the sex-equipment was pursued in the absence of the directing influence of the gonad. If there is a time seriation in the differentiation of the component parts of the sex-equipment, one structure becoming capable of responding to the stimulus of the sex-hormone of the testis before another, then the degree of abnormality of the sex-equipment consequent upon a retardation in the exhibition of the stimulus will be a reflection of the degree of retardation. The facts that there is a very wide range of abnormality in these cases; that they can be arranged in a series with an almost normal female at one end, and an almost normal male at the other; that in all cases testicular tissue alone is found, whereas in none is evidence of degenerate ovarian tissues present; and that in all cases the later exhibited sex-dimorphic characters are entirely and completely male, point to the conclusion that these cases are males in which the time of differentiation of the testes has been abnormal.

The part played by the sex-hormones in the production of this kind of intersexuality is best illustrated by the case of the bovine freemartin—a genetic female (XX) co-twin to a normal male—the reproductive system of which becomes abnormal during the period of sexual differentiation as a result of the action of the sex-hormone of a male co-twin *in utero*. Twins may be monovular or identical, and those arising from one and the same egg are always of the same sex and very similar in their characters; or they may be binovular or fraternal, resulting from the synchronous fertilization of two separate ova. In the latter case they may or may not be of the same sex, and do not resemble one another any more closely than do brothers and sisters born at different times. Twins in cattle may consist of two normal males, two normal females, one male and one female each normal, or one male and the other an individual with an abnormal reproductive system and known as a "freemartin." In all save one of 126 cases of twins in cattle thoroughly examined, two corpora lutea were found. This shows that twins are almost invariably binovular in this animal, since two ova are concerned in female there is no such anastomosis.

The two fertilized ova pass into the bicornuate uterus and become attached to the uterine mucosa. If they have been discharged from the same ovary, the zygotes usually develop in one and the same uterine horn. As the zygotes increase in size, the embryonic membranes of the two foetuses meet to adhere and in many cases to fuse. If such fusion occurs, an anastomosis of their blood vessels can result, so that a common vascular intercommunication may become established. It is to be noted that in the case of twinning involving one normal male and one normal female there is no such anastomosis.

Thus the situation arises in which the sex-hormone of each developing individual is at liberty to pass into the tissues of its co-twin. The sex-hormone is the instrument which models the sex-organization alone. The internal secretions of the pituitary, thyroid, adrenal, and so forth, can also pass from each individual to the other, but these are mainly concerned in the general and not in the special development of the individual, and will be alike in both twins.

But if it so happens that the twins are bisexual (and a study of the sex-ratio in cattle shows that by the laws of probability three possible sex-combinations in twinning must occur, in the proportion of 1♂♂ : 2♂♀ : 1♀♀, and that the twin combination that includes a freemartin must be regarded as male : female), and if the fusion of the chorion occurs, and further if a vascular intercommunication becomes established, as it does in seven cases out of eight, the sex-differentiation of both individuals will be directed by that sex-hormone which is exhibited earlier, or which is more potent. The testis becomes differentiated at an earlier stage of development than the ovary, and so the sex-hormone of the male is liberated before that of the female. The female twin (that is, genotypic female) will pursue her sex-differentiation under the direction of the male sex-hormone of her co-twin, and will therefore come to possess more or less completely the organization of the male. The assumption of the male characters in the case of the foetuses examined is imperfect; the external genitalia are of the female pattern, the internal organs of reproduction more or less completely male. The male sex-hormone is liberated before the embryonic gonads of the genotypic female have undergone differentiation into ovaries; such differentiation is prevented, and so there is no question of a competitive action between male and female sex-hormones. The end-result will have a relation to the time of exhibition and to the efficiency of the male sex-hormone. The variation in the size of the testes of the male co-twin and of the extent of vascular intercommunication seems to point to the conclusion that the amount of the hormone is not a significant factor in the production of a freemartin, but

that there is a minimum stimulus, and the reaction is of the "all-or-none" type. It is seen that the tissues of the genotypic male respond completely to the stimulus of the testicular sex-hormone, whereas those of the genotypic female fail to do so. Now it is known that genotypic male and female tissues are to be distinguished by differences in their chromosome content, and it is reasonable to assume that, because of these differences, they differ also in their physiological constitution. It is probable, therefore, that though both kinds may be capable of responding to one and the same sex-hormone stimulus, they will respond differentially. The male co-twin develops testes because he is a genotypic male, and becomes a phenotypic male because he develops testes. His embryonic gonads become testes because their differentiation was pursued under the direction of the male-differentiating reactions elaborated by the interaction of the genes in the sex-determining gene-complex. The sex-hormone elaborated by the testes, passing into the body of the genotypic female, swings her sexual differentiation in the male direction, but the swing is not complete, because the sex-hormone of the testis is not equivalent physiologically to the male-differentiating substances elaborated by the sex-determining factors, and because her tissues are constitutionally different from those of the genotypic male.

It is seen that in the mammal the most distinctive sex-dimorphic characters are the secondary gonadic, and that for the development and maintenance of these the presence and action of functional gonadic tissue is necessary. The physiological action of gonadic tissues of the opposite sex causes the further development of incompletely differentiated structures to follow the direction appropriate to that sex, and, so far as is morphogenetically possible, renders the individual intersexual.

AMOEBIC DYSENTERY.

I.—INVESTIGATIONS INTO THE LIFE-HISTORY OF ENTAMOEBA HISTOLYTICA.*

BY

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IT is now generally agreed that the function of the cyst formation in *Entamoeba histolytica* infections is the propagation of the parasite from one host to another. This belief is based on sundry observations of a more or less satisfactory nature. There is much evidence indicating that in ordinary circumstances the active amoeboid stage of the parasite does not long survive after passage of the faeces. Dobell and O'Connor (1921) write that "In ordinary circumstances the free forms cannot live outside the body for more than a very short time; they die if swallowed." This view is also shared by Wenyon (1926), both as a result of personal observations and of his researches into the literature on the subject. Wenyon also states that "unless cysts are present the animals cannot be infected by feeding." In short, it was until quite recently believed that there are two possible ways of infecting animals—namely, as Dobell and O'Connor write, "by feeding them upon the cysts of the parasite, or by injecting active amoebae into the large intestine."

In further support of the view that the purpose of cyst formation is solely for the propagation of the parasite from one host to another are the investigations which have been made on excystation. This work has suggested that the cysts of *Entamoeba histolytica* will hatch only after they have been subjected to the action of the gastric and pancreatic juices, or to that of the pancreatic juice alone. Study of the literature indicates that this hypothesis is probably mainly based on the observations of Ujihara (1914), of Penfold, Woodcock, and Drew (1916), of Chatton (1917), and of Cutler (1919). Ujihara records that cysts after incubation with gastric juice for twenty-four hours at 37° C. remained for the most part undigested, but that pancreatic juice was much more active. Penfold, Woodcock, and Drew write as follows: "As excysting agents we have tried pepsin in an acid medium, bile, and pancreatic extract, either alone, consecutively, or together, as appeared indicated, but the only success we have had has been with pancreatic extract used alone." Cutler states that "if a solution of 'liquor pepticus' is first allowed to act on the cysts for a short time, followed by a similar solution of 'liquor pancreaticus,' a very large proportion of the treated cysts react." Chatton's experiments were of a different type, but permit of similar conclusions; he fed cats with *E. histolytica* cysts, and sacrified the animals after periods varying from three and a half to seventeen hours; careful examination of the contents of different portions of the alimentary canal caused him to draw the conclusions that cysts pass through the stomach without alteration, except for digestion of the chromidial bars, and that excystation takes place in the small intestine.

It is remarkable that these workers have either overlooked, or ignored, the very interesting paper of Darling (1913). Chatton, it is true, refers to his work, but offers no comment upon it. Darling describes the gradual disappearance of cysts from moist chamber preparations of heavily infected faeces, and also the development of amoebulae within the cysts, and their emergence. This statement is so definite, and based apparently upon such careful observations, that it is curious it should have escaped comment from those who later worked on the same subject. Probably there are several reasons for this, most influential of which was the general preconception that the cysts must be swallowed before they can develop; another consideration was, doubtless, the possibility that Darling's preparations were—as so often happens in the tropics—contaminated with free-living amoebae. However this be, the fact remains that Darling's work seems to have been more or less ignored, and the view generally accepted that *E. histolytica* only excysts when it has been swallowed and subjected to the influence of the digestive juices. Dobell and O'Connor (1921), in their book on *The Intestinal Protozoa of Man*, after considering previous work on the subject conclude that "it is certain that the cysts never hatch in the colon where they are found, or outside the body."

In 1924, however, an important piece of work was published by Sellards and Theiler, which indicated that *E. histolytica* cysts would hatch when injected intrarectally into kittens; and their work, which was very carefully controlled, has more recently been confirmed by Hoare (1925). This observation is naturally of considerable interest and reopens the whole subject regarding the conditions necessary for excystation of *E. histolytica*; possibly it may have some bearing on relapse production in amoebic dysentery, as it has been suggested by Sellards and Theiler that relapses may, at times, be due to excystation of cysts which have persisted for some time in the colon.

With the object of throwing light on the matter, we have during the past two years conducted numerous experiments, details of some of which have already been published elsewhere (Yorke and Adams, 1926 and 1927). In the present communication we propose to summarize the main conclusions reached in these papers, and to refer to other and more recent observations which appear to us to bear on the life-history of *E. histolytica*.

The work commenced with the inoculation of a couple of tubes of Locke-egg-serum medium (Boeck, 1924, and Boeck and Drbohlav, 1925) with a small amount of human faeces containing numerous cysts of *E. histolytica*, and incubating at 37° C. On examining the tubes next day we were surprised to find large numbers of active amoebae, morphologically indistinguishable from *E. histolytica*. As no vegetative amoebae were observed in the stool at the time of inoculation, it appeared that those present had originated from the cysts. Many similar

*A paper read in opening a discussion on amoebic dysentery in the Section of Tropical Diseases at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

experiments with the freshly passed stools of the same patient, and also with those stored at laboratory temperature for three or four days, gave comparable results; as did likewise experiments performed with the stools of other patients which contained cysts of *E. histolytica*. We were therefore forced to the conclusion that, contrary to the general opinion, *E. histolytica* cysts are capable of hatching *in vitro* if the circumstances are suitable.

In order to study under the most favourable conditions this very interesting phenomenon we devised various methods for concentrating the cysts and separating them from most of the faecal material and bacteria. That giving the best results is as follows:

A mass of faeces is ground up with water in a small mortar, and the emulsion shaken up with 500 or 1,000 c.cm. of water, poured into a tall glass cylinder, and allowed to stand for fifteen minutes to permit the coarser faecal material to settle. The supernatant fluid is withdrawn and either centrifuged or allowed to stand overnight in a cylinder; the deposit is then shaken up thoroughly with a solution of cane sugar in water, of a specific gravity of about 1080, and centrifuged at high speed. This procedure results in separation of the vast majority of the cysts from the remaining faecal material, the faeces being precipitated, and the cysts floating in the supernatant fluid, which is withdrawn, diluted with about four times its volume of water, and again centrifuged at high speed; by this means a small deposit is obtained, consisting of great numbers of cysts in a relatively minute quantity of faecal material. The deposit is then washed several times with water, to get rid of all traces of sugar and the majority of the remaining bacteria.

Washed concentrated suspensions of cysts prepared by this method were found to give remarkably satisfactory cultures of *E. histolytica*; the relatively few bacteria which such suspensions contained, as compared with the original faeces, enabled the excysted amoebae to become well established before the growth of bacteria swamped them; and owing to the great number of parasites such cultures contained, and the relatively minute quantity of faecal debris, we were enabled to study the stages of development of the cysts, and their excystation, under most favourable circumstances, both in the living state and in stained preparations.

Before discussing the changes leading up to excystation it would be well to point out that the cysts passed by different patients, and even by the same patient at different times, vary greatly in appearance, especially in respect of the number of nuclei they contain, and of their chromatoid bodies and glycogen. Thus, on one occasion, the cysts may be practically all uninucleate with much glycogen, and but few of them containing chromatoid bodies, whereas, on another occasion, the vast majority may be quadrinucleate, with chromatoid bodies and but little glycogen. To cite an extreme case:

A chronic dysenteric patient, A. P., passed on May 4th, 1926, a stool containing numerous *E. histolytica* cysts; on making a differential count of an iodine-stained preparation it was found that the various types—as regards number of nuclei—were present in the following proportions: uninucleate 5 per cent., binucleate 7 per cent., quadrinucleate 82 per cent., and those with indeterminable nuclei 6 per cent.; in a stool passed three days later a differential count revealed the various types of cysts to be present in the following proportions: uninucleate 83 per cent., binucleate 6 per cent., quadrinucleate 6 per cent., and those with indeterminable nuclei 5 per cent.

The fact that a patient may pass practically only uninucleate cysts on one occasion, and only quadrinucleate cysts on another occasion, is very interesting, and its correct explanation would seem to us to throw important light on the life-history of *E. histolytica*. But before going further into this matter we propose to take into consideration the changes occurring in the cysts during cultivation *in vitro*.

When the washed concentrated suspensions of cysts referred to above were sown on Locke-egg-serum (L.E.S.) medium, and incubated at 37° C., the cysts were found to develop rapidly, the uninucleate and binucleate cysts quickly being converted into quadrinucleate individuals; and after a few hours free amoebae began to make their appearance in the cultures. A single example will make this clear:

A differential count in iodine showed that a concentrated cyst-suspension contained 57 per cent. of uninucleates, 18 per cent. of binucleates, 15 per cent. of quadrinucleates, and 10 per cent. of individuals in which the nuclei were either indistinct or the cysts were shrunken or granular; after incubation of this suspension on L.E.S. medium at 37° C. for three and a half hours the differential count was as follows: uninucleate cysts 4 per cent., binucleate cysts 8 per cent., quadrinucleate cysts 41 per cent., cysts with indistinct nuclei, or shrunken and granular, 33 per cent., free amoebae 14 per cent. More prolonged incubation resulted in almost complete disappearance of the cysts and their replacement by free amoebae; many empty cyst envelopes were also to be seen.

After much close study of fresh and stained preparations of cultures of different ages we are able to give the following account of the developmental stages in the cysts which terminate in excystation.

The youngest cysts are uninucleate and loaded with glycogen; as development proceeds chromatoid bodies make their appearance, the nuclei divide, and the glycogen decreases in amount. Later the cyst becomes quadrinucleate; chromatoid bodies are well developed, but the glycogen is much less evident, or entirely absent. When the cyst is completely mature, and ready to excyst, the nuclei are agglomerated, and the cytoplasm is homogeneous and without glycogen; the chromatoid bodies are greatly reduced or absent. We have failed to observe any evidence of autogamy in the development of the cysts, but we have frequently seen chromatin particles apparently extruded from the nuclei immediately prior to, or during, division.

The recently excysted *E. histolytica* contains four closely agglomerated nuclei, and the cytoplasm is very finely alveolar. It moves in a characteristic slug-like manner, with the nuclei almost invariably anterior, and drags behind a more or less motionless tail; as bacteria are ingested the cytoplasm becomes more alveolar and digestive vacuoles quickly appear.

In cultures the majority of the excysted quadrinucleate amoebae divide, either directly or indirectly, into four uninucleate individuals; but in a certain proportion the cytoplasm fails to divide and individuals containing many nuclei are developed; these multinucleate forms frequently grow to very large dimensions. Here again we were unable to observe any indication of autogamy.

These observations show that, contrary to general belief, *E. histolytica* cysts readily develop and hatch under suitable conditions *in vitro*. So far as we have been able to ascertain, moisture and a suitable temperature (preferably about 37° C.) are essential for development and excystation; the passage of the cysts through such solutions as liquor pepticus or liquor pancreaticus is unnecessary for excystation.

Shortly after the publication of our preliminary paper, in which these observations are set forth in detail, a communication appeared from Dobell and Laidlaw (1926) which confirmed this work, in so far as they state that they were able to initiate cultures from the cysts of *E. histolytica* passed in faeces. They, however, add that "Cysts just passed in stools do not hatch or develop further if placed immediately in culture media and incubated at 37° C.; they merely die. They must first be allowed to cool, and then must be kept for a certain time." The time required for "maturation" outside the body is stated to be approximately one or two days. This statement obviously raises very important epidemiological questions, for it implies that the faeces of chronic dysenterics are not infective for one to two days after being voided. It is furthermore in conflict with our own impressions, for although we had not specially investigated this point when we published our previous papers, yet we have amongst our protocols many records of the successful initiation of cultures from *E. histolytica* cysts passed only three or four hours.

In view of the practical importance of the point it appeared to us desirable to reinvestigate the subject; and with this object in view a number of patients suffering from chronic amoebic dysentery were from time to time brought to the laboratory and asked to evacuate their bowels, so that the freshly passed stools could be sown immediately on warm Locke-egg-serum medium. A differential count in iodine of the various cysts and vegetative amoebae (that is, as regards the number of nuclei they contained) was made immediately on passage of the faeces, and also after cultivation on L.E.S. medium for five hours. In all observations of this kind it was found that the cysts developed in a perfectly normal manner, the great

majority of the uni- and bi-nucleate individuals becoming rapidly converted into quadrinucleates. When, however, we come to the question of excystation the problem is distinctly more complicated. Differential counts revealed in numerous experiments a very varying degree of excystation: on some occasions none of the cysts hatched, but on others a considerable proportion were found to have excysted; the proportion varied greatly, but in no instance did it exceed 58 per cent.

In casting round for an adequate explanation of this defective excystation several possibilities present themselves. In the first place, although it is clear that the great majority of the uni- and bi-nucleate cysts were alive, as they developed into quadrinucleate individuals, it is possible that many or all of the quadrinucleates present in the faeces at the time of passage were dead; and such an hypothesis would explain the relatively small hatch usually obtained. In the second place, it is conceivable that, even though all the cysts were alive at the time of the passage, only limited excystation took place in certain experiments, and in others none at all, because, as Dobell and Laidlaw state, maturation outside the body at low temperatures is an essential factor for excystment; or, in the third place, some unknown factor in the conditions of the experiments might have been more or less inimical to excystment.

In order to investigate these points, and more particularly as to whether some at least of the quadrinucleate cysts were dead at the time of passage, or whether cooling outside the body is essential for excystation, experiments of the following nature were undertaken:

A differential count of the cysts and vegetative entamoebae in the stools of a chronic dysenteric was made immediately after passage in the laboratory, and a portion of the stool was sown immediately on warm L.E.S. medium. From the remainder of the stool a concentrated washed suspension of cysts was rapidly prepared according to the second procedure described in our first paper (1926), care being taken to maintain the temperature at 37° C. throughout the operation. During the preparation of the cyst-suspension, which occupied approximately one hour, all the vegetative forms were destroyed. A differential count of the cysts in the concentrated suspension was then made, and a portion was sown immediately on warm L.E.S. medium. Finally, differential counts in iodine were made of each of the above cultures after incubating at 37° C. for various periods.

The results of these experiments showed that, whereas the degree of excystment resulting from cultures of the original faecal mass varied from 0 to 40 per cent., that resulting from similar cultures of the washed concentrated cyst-suspension prepared at 37° C. varied from approximately 60 to 95 per cent. From this we are able to conclude: (1) That cooling outside the body is not essential either for the development of the cysts or for their excystation. (2) That usually the great majority of cysts are alive at the time of passage; this is clearly evident from the fact that cultures of washed concentrated cyst-suspensions usually resulted in a hatch of 80 to 90 per cent. of the cysts. On certain occasions, however, the fact that hatches of only 60 or 70 per cent. were obtained, even under the most favourable conditions, suggests that an appreciable proportion of the cysts—probably of the quadrinucleate type—were dead at the time the faeces were passed. (3) As the relatively poor hatch obtained from cultivation of freshly passed faecal material cannot therefore be explained either on the ground that cooling outside the body is necessary for excystation, or on the ground that the majority of the cysts were dead when passed, it must be the result of something in the faecal material itself which, although not preventing development of the cysts, does inhibit their excystation.

But before proceeding to further evidence in support of this contention it appears desirable to return to another question raised by Dobell and Laidlaw. These authors claim that it is only the completely developed cysts which survive cooling outside the body; they write: "When this (cooling to laboratory temperature) is done . . . all immature cysts cease to develop and likewise ultimately die; but all fully formed cysts remain alive and unaltered for a considerable time." This again raises a point of considerable practical importance, for it implies that a stool, such as the one referred to above, in which the uni- and bi-nucleate cysts constituted about 90 per cent. of the total present, is relatively only very slightly infective after it has been passed for a short period.

Numerous experiments have satisfied us that cooling the faeces, or the washed concentrated cyst-suspensions, either to 0° C. or to laboratory temperature, for periods varying from an hour to two or three days, does not cause the uni- and bi-nucleate cysts to die more quickly than the fully developed quadrinucleate individuals. In fact, the evidence shows that cooling the faeces to 0° to 5° C. for one or two days has no appreciable effect on either the immature or mature cysts.

Returning to the question of the inhibitory effect of faecal material on excystation, experiments of the following nature were performed:

A washed concentrated suspension of cysts, prepared as previously described, was sown on L.E.S. medium, and also on this medium to which had been added, either at the time of sowing or two hours previously, a piece of faeces about the size of a pea. Differential counts were then made after incubation at 37° C. for various periods. In other experiments an extract was made by rubbing up a little of the faeces with Locke serum in a mortar, and then precipitating as far as possible the faecal material by prolonged centrifuging at high speed; the supernatant fluid was used for covering the egg slopes, and after warming to 37° C. the cyst-suspension was sown. Here again differential counts were made after incubating at 37° C. for various periods.

The results of these experiments showed that the presence of faeces, or of faecal extracts, in the culture tubes had a definitely inhibitory effect on excystation, although it did not prevent the development of the uni- and bi-nucleate stages into the quadrinucleate.

Hitherto we have had no absolutely satisfactory criterion which would enable us to decide whether *E. histolytica* cysts are alive or dead. The usually accepted method of determining their viability is their behaviour in dilute eosin solution. This test is based on the assumption that dead cysts stain immediately with weak solutions of eosin in water, whereas living cysts do not, but whether this assumption is wholly justifiable is a matter of very considerable doubt; it is highly probable that the cysts which stain are actually dead, but whether all those which do not stain are alive is a much more doubtful matter. The method described above of sowing washed concentrated cyst-suspensions on L.E.S., and observing the proportion of cysts which have hatched after incubation at 37° C. for various periods, has proved a much more reliable test of viability, and has enabled us to investigate certain important questions such as the longevity of the cysts under various conditions *in vitro*, and their resistance to heat and to various drugs and chemicals.

The results of such experiments have shown that *E. histolytica* cysts commence to die fairly rapidly in faeces which have been kept at laboratory temperature (16° to 20° C.) for three or four days, and that all are dead within about ten days; approximately the same result is obtained when the faeces are kept at 0° C. in the ice-chest. When freshly passed stools are placed immediately in the incubator at 37° C., the cysts are found to be practically all dead within a period of less than twenty-four hours; the precise period appears to vary with different stools, and in some instances but few cysts survive for longer than eight or ten hours. Washed suspensions of *E. histolytica* cysts in water live rather longer, more especially when stored at 0° C.; but even under these conditions live cysts are not found after three weeks.

E. histolytica cysts survive a temperature of 45° C. for thirty minutes, but are killed within five minutes by a temperature of 50° C. The cysts are remarkably resistant to emetine and to Yatren; and relatively so to hydrochloric acid and chlorine, the last named, in strengths far in excess of that used in the bacteriological sterilization of water, having no effect on the cysts within a period of half an hour.

Returning now to the interesting observations of Sellards and Theiler—that kittens can be infected by intrarectal injections of *E. histolytica* cysts—we have already mentioned that these authors have advanced the hypothesis that relapses may, on occasions, be due to hatching of cysts which have persisted in the colon for some time. This is obviously a question of great practical importance, and merits serious consideration. Hegner (1927) refers to this work in his recent book, and writes as follows:

"Presumably excystation may also take place in the large intestine of man. Sellards and Theiler have gone even further, and suggest that cysts may hatch in the colon of the same individual in which they are formed. Relapse in amoebiasis may, according to this view, result from the hatching of resistant cysts held for long periods in the intestine. However, the observation of Dobell and Laidlaw that cysts must be cooled below body temperature for several days before they will hatch indicates that cysts could not hatch until they had passed out of the body of the host in which they encysted."

But as we have already shown, in the experiments recorded above, Dobell and Laidlaw are mistaken when they state that cysts must be cooled outside the body before they can excyst and develop further; so that no valid argument appears, up to the present, to have been advanced against Sellards and Theiler's hypothesis. Many of the facts brought to light in our investigations appear, however, to bear on the matter, and to indicate that cysts do not hatch in the body of the host in which they are formed.

The first question which of necessity arises, in considering the subject, is the length of time *E. histolytica* cysts live in the human body. There seems to be no reasonable ground for doubting that the cysts are formed from the precystic stage either on the surface of the ulcers or, more probably, in the lumen of the gut. The period occupied by the conversion of the precystic stage into the cystic stage is not known, but such evidence as there is suggests that it must be comparatively short. The small precystic entamoeba can often be found in small numbers, if looked for carefully, in freshly passed stools which, at first sight, contain nothing but cysts. On several occasions saline enemata given to chronic dysenterics, whose stools contained apparently only the cystic stage, produced large numbers of the precystic forms; and again, it is generally recognized that an aperient will cause in similar cases the appearance of precystic amoebae in the stools. After the effect of the enema or aperient has ceased, the precystic forms are again replaced by cysts. When once the cyst is formed it quickly develops at 37° C. into the mature quadrinucleate individual. Numerous experiments have shown that *in vitro* the uni- and bi-nucleate cysts are converted into quadrinucleates within a period of three to four hours. This fact affords an entirely satisfactory explanation of the observation previously referred to—namely, that the cysts passed by different patients, and even by the same patient at different times, vary greatly; on one occasion they are practically all uninucleate, whereas on another occasion they are practically all quadrinucleate.

The stage in which a cyst is passed obviously depends on the length of its sojourn in the bowel; and as a general rule we have noted that, in the case of a patient whose bowels are moved several times a day, the proportion of uninucleate cysts is materially higher than in cases where there is only one motion daily. There must be exceptions to this generalization, as obviously the site of the lesions will exert some influence; if the precystic amoebae are formed in ulcers situated in the caecum, the cysts, other things being equal, will naturally be longer in the bowel than if the site of their formation is in the lower 10 or 15 cm. of the rectum.

There is thus substantial reason for believing that the interval occupied by the development of the precystic stage into the mature quadrinucleate cyst is comparatively short, probably not exceeding six to eight hours. Furthermore, experiments *in vitro* and *in vivo* show that under suitable conditions mature quadrinucleate cysts hatch within a few hours. It is unnecessary to mention again the *in vitro* experiments which we have already discussed fully, but brief reference might here be made to certain hitherto unpublished *in vivo* experiments. It was found that when washed concentrated cyst-suspensions were injected intraperitoneally into mice, or subcutaneously into guinea-pigs, the cysts hatched within a period of three or four hours; and in a certain proportion of cases the infection developed, with the production of general peritonitis, or large subcutaneous abscesses, in which vegetative amoebae were to be found in considerable numbers. These observations are in agreement with those of Chatton, who found free quadrinucleate amoebae in the intestine of a kitten three and a half hours after feeding it with human faeces containing *E. histolytica* cysts. We can therefore conclude that under suitable conditions *E. histolytica* can pass from the precystic form, through the various cystic stages, to the excysted quadrinucleate amoeba within a period of twelve hours. If this happened in the bowel large numbers of cysts would be constantly hatching, and wasted for the purpose for which they are intended, providing the patient did not have more than one or two motions daily. There is, however, very considerable evidence to show that this does not happen. In the first place, notwithstanding the most careful search on innumerable occasions, we have never found in the stools any forms resembling the characteristic recently excysted entamoeba, with its four closely agglomerated nuclei; and in the second place, although the process of development proceeds apparently uninterruptedly to the formation of the mature quadrinucleate cysts, these do not hatch in the bowel, possibly partly owing to lack of sufficient moisture in the contents of the rectum, but mainly because of the presence in the faeces of something which inhibits excystation.

Although the mature quadrinucleate cysts will not hatch in faeces, there is evidence that they will remain viable in the bowel for some time. How long this is we do not know; but we have already referred to the fact that when infected faeces, containing large numbers of quadrinucleate cysts, are kept in the incubator at 37° C. the cysts do not survive longer than from about eight to eighteen hours, the precise period varying with different stools. This does not, of course, mean that they cannot survive for longer periods in the bowel, as, doubtless, changes inimical to the cysts occur in faeces kept outside the body at 37° C.; but these observations, together with the facts that in the stools of every patient we have examined a certain number of cysts appeared to be dead when passed, and that the number of these is greater in hard constipated stools, suggest that the period for which the mature quadrinucleate cysts can live in the bowel is probably not more than a day or two at most.

Our investigations therefore lead us to the belief that the development of *E. histolytica* from the precystic form to the fully mature quadrinucleate cyst proceeds steadily, and without interruption, in the lumen of the bowel, and that the whole process occupies only a few hours; the mature quadrinucleate cysts do not hatch in the bowel, but can survive there for a period which is strictly limited, probably not more than a day or two at the outside. It is not easy to harmonize Sellards and Theiler's observation with these views, but the following reflections appear to us to be relevant. Obviously there may be some essential difference between the large intestine of the kitten and that of man; and it is possible that the contents of a kitten's rectum may not have the same power of inhibiting excystation as has that of the human rectum. Then again it must be remembered that fluid is essential for excystation, and that this factor was supplied in Sellards and Theiler's experiments in the form of the 3 c.cm. of saline in which they suspended the small quantity of faecal material injected. Such injections would probably lie, at first at any rate, below the faecal mass in the kitten's bowel, and in contact with the mucous membrane; and the cysts would not be so intimately intermingled with faecal material as is the case in the human intestine. It seems to us that it is quite probable that in such circumstances the conditions might not be sufficiently unfavourable to prevent entirely excystation of the injected cysts, and that those which did excyst might succeed in penetrating Lieberkühn's crypts, and in invading the bowel wall of a susceptible animal like the kitten.

Notwithstanding, therefore, the interesting observations of Sellards and Theiler, we adhere to the belief that the sole purpose of cyst formation in *E. histolytica* infections is the propagation of the parasite from one host to the next; and that Nature has devised a method of safeguarding this, and of preventing the wastage which would result if hatching of the cysts occurred in the intestine in which they are formed.

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II.—RECENT ADVANCES IN THE TREATMENT OF AMOEBIC DYSENTERY:

TOGETHER WITH AN ACCOUNT OF THE SIGMOIDOSCOPIC APPEARANCES OBSERVED IN DIFFERENT STAGES OF THE DISEASE.*

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CASES of amoebic dysentery are not only difficult to cure, but they are also exceedingly common, and it is obvious that any step forward in treatment should be eagerly looked for and as readily tested.

The first really specific treatment of amoebic dysentery was with ipecacuanha. There is no question that in many cases it was efficacious, but it was soon superseded by emetine, which was introduced by Sir Leonard Rogers in 1911; we rarely prescribe ipecacuanha nowadays.

The introduction of emetine was a definite step forward, and it still seems to us to be the treatment of election in the early stages of acute amoebic dysentery and for amoebic hepatitis. However, even with careful treatment a certain percentage of cases relapse, and subsequent treatment with a further course of the same drug is often of no avail; in other words, the entamoebae in these cases have become emetine-resisting. Our experiences with emetine as a means of eradicating the intestinal infection have been distinctly disappointing, and the results of observations on 87 of the cases under our care in the Hospital for Tropical Diseases were published by Rennie in 1922.[1] Chronic cases, too, often do not respond at all well to emetine injections, and we have seen patients treated repeatedly with doses of 80 grains, or more, of emetine over a prolonged period without permanent benefit.

Emetine-Bismuth-Iodide.

Emetine-bismuth-iodide, which is given by the mouth, was then adopted in place of injections of emetine, and, undoubtedly, many cases which failed to respond to emetine were cured by this drug.

The following cases illustrate the remarkable curative effect of emetine-bismuth-iodide uncombined with any other form of treatment:

A marine who contracted amoebic dysentery in China in 1912 was seen in 1924 after repeated relapses, which during twelve years had been treated with emetine. There was extreme wasting; the weight was only 8 st. 7 lb.; the general condition was poor, and the patient was passing about ten stools daily swarming with active amoebae. Sigmoidoscopic examination showed numerous ulcers. After 36 grains of emetine-bismuth-iodide he put on 7 lb. in weight in ten days. He has remained free from symptoms since, and returned to work.

Another patient contracted amoebic dysentery in Trinidad in 1914; this was followed by frequent relapses till his admission to hospital in 1922. He was treated with many courses of emetine injections without avail. Great emaciation was present, and he lost 3 st. in weight, while passing nine to twelve stools a day containing free entamoebae. A preliminary course of 10 grains of emetine stopped the more acute symptoms, but he continued to pass free entamoebae. He then had two full courses of emetine-bismuth-iodide, one of 30 grains and another, two weeks later, of 16 grains. The stools had been free from entamoebae ever since; the patient improved remarkably in general condition and had put on a stone in weight. For the last three years he had been back at his work in Equador, remaining free from symptoms.

The total number in this series treated with emetine-bismuth-iodide alone was 40 cases. Out of these there were 5 in which full courses of this salt and of emetine periodide had no permanent effect.

The more acute the symptoms, the more striking and permanent were the effects of treatment with emetine-bismuth-iodide.

Emetine periodide proved less satisfactory, for out of 12 cases treated with it, 5 had to be subsequently treated with emetine-bismuth-iodide in order to be completely cured.

Three of our patients treated with emetine-bismuth-iodide relapsed after as many as nine courses of treatment, demonstrating the well known fact that entamoebae become resistant also to this drug. There is no doubt that its introduction has considerably raised the percentage of cases of chronic amoebic dysentery permanently cured, but there still remains a fairly large residue who, in spite of all known treatments, live with the certainty that sooner or later they will relapse to their former condition, passing numerous stools with blood and mucus. Such patients usually become neurasthenic.

Not even the most enthusiastic advocate of emetine or emetine-bismuth-iodide would claim that such treatment is ideal from the point of view of the patient. The administration of emetine means a rather painful injection, and emetine-bismuth-iodide is notoriously likely to result in distressing vomiting. The well known toxic effects of emetine are also a much graver objection to its use, resulting, as a general rule, in an appreciable fall of blood pressure—about 20 mm. of mercury. The circulatory system is particularly liable to be involved, and the very characteristic "emetine pulse," and cardiac irregularities of various types, are not infrequently seen. From the mental point of view emetine is sometimes a depressing drug, and a very painful neuritis and desquamation of the skin are well known sequels. We have found that such untoward symptoms are less likely to supervene if a more generous diet is allowed than the milk diet originally suggested. Still, in treating a series of cases, some will always be met with in which the full course of treatment cannot be tolerated, especially among women and children. A less toxic and more efficient drug had clearly become very desirable in the treatment of amoebiasis.

Yatren.

In 1921 P. Mühlens and W. Menk first introduced a new drug called Yatren 105. It is an iodine-oxyquinoline-sulphonic acid compound, and may be given orally, rectally, intramuscularly, or even intravenously. We have experience only of the first two methods, but have now used them on a large series of cases.

By the mouth the usual dose given by most workers has been 15 grains thrice daily, but we found that such a dosage caused diarrhoea, and were content with a smaller dose—4 to 8 grains thrice daily. It may be given in pill form or in cachets.

By the rectum yatren is given as an enema, the quantity used being 200 c.cm. of a 2½ per cent. solution. The rectum is first cleared out by a preliminary enema of 2 per cent. sodium carbonate, 1 pint, and then the yatren solution is run in slowly and retained as long as possible. Most of the patients can retain it about six to ten hours, and after a little experience many of them can hold it for a much

* Read in the Section of Tropical Diseases at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

longer period. Proof of absorption consists in testing the urine with iron perchloride, the yatren giving rise to a greenish colour.

The course of treatment adopted on the continent consists in giving it for ten days by the mouth combined with ten daily injections by the rectum. It is good practice to repeat the course after an interval of five to seven days. The diet should be light, and can include fish, pudding, and chicken; a milk diet alone is quite unnecessary. Apart from the diarrhoea following large doses by the mouth, we have observed no toxic symptoms attributable to yatren, and we have not been able to find any evidence of such in the literature. It certainly is a very safe drug; in spite of the large amount of iodine in the combination, symptoms of iodism are unknown. It is possible to give it to children, which is a great advantage as compared with emetine and emetine-bismuth-iodide. Mild cases, such as cyst passers without symptoms, may be treated without confinement to bed, but absolute rest should be part of the treatment of any more acute dysenteric condition.

The mode of action of yatren is a little uncertain, but it is claimed that it is a definite cell stimulant. According to Kofoid and Wagener, it has *in vitro* no very powerful action on *Entamoeba histolytica*. On the other hand, Vogel,[2] in a recent communication, has adduced clear evidence that yatren in a dilution of 1 in 100 is capable of exterminating all the entamoebae in artificial culture within a period of three hours and, in a higher dilution (1 in 1,000), it prevents the multiplication of this organism from taking place after a period of twelve hours.

Yatren is certainly a safe non-toxic drug, and much more pleasant from the point of view of the patient, who, as a general rule, increases in weight during the treatment. We believe it to be a drug of the very greatest value and can fully confirm its efficacy in curing long-standing cases of amoebic dysentery which have proved resistant to emetine and emetine-bismuth-iodide. This is illustrated by the following rather striking cases.

Cases Treated by Yatren Alone.

Out of four cases treated by yatren alone which one of us reported in 1925 one relapsed subsequently, and was treated with emetine-bismuth-iodide.[3] Since then we can quote the following:

One patient had frequent relapses of dysentery dating from 1916 in Salonica; he was treated frequently with full courses of emetine and emetine-bismuth-iodide. In hospital, two weeks after a full course of emetine-bismuth-iodide he developed amoebic hepatitis, followed by a relapse of dysentery. In February, 1925, yatren was given by the bowel for ten days, and also yatren pills by the mouth, 24 grains daily. The amoebae disappeared, and the stools were reduced to one daily. He gained 5 lb. in weight in ten days, and in a month's time he had added another 16 lb. He returned to Nigeria, and in February, 1926, had had no relapses; he has remained in perfect health.

Another patient, who contracted amoebic dysentery in 1922 in St. Vincent, had had 68 grains of emetine with frequent relapses and was invalided home. After admission to hospital he was treated with two full courses of emetine-bismuth-iodide, but he relapsed nine months later with amoebic hepatitis and dysentery. In November, 1924, he received a full course of yatren by the bowel; he has remained in good health ever since, and has returned to duty in the tropics.

A third patient had dysentery in Gallipoli in 1915. He was given numerous injections of emetine at the time and emetine-bismuth-iodide in full doses in 1918 and 1919. In spite of this, diarrhoea returned every two months with blood, mucus, and free entamoebae. He was given a course of ten yatren lavages in December, 1925. He reported at the beginning of 1927 that he had been free from symptoms since the treatment.

The question naturally arises, Has yatren any value in the treatment of amoebic hepatitis? Beyond the case quoted above we have no personal experience of this, but several cases presumably cured in this manner are recorded in the literature. Further observations on this point are necessary. The next question is whether yatren fails more often than emetine-bismuth-iodide. To this it must be answered that, although its action appears to be curative when the lesions are situated in the lower portion of the large intestine, there are patients who relapse owing to lesions in the caecum and transverse colon. To meet this contingency we have introduced what we believe to be the treatment of election for intractable cases of amoebic dysentery—that is, emetine-bismuth-iodide given by the mouth and yatren administered by the rectum simultaneously.

Combined Treatment with Yatren and Emetine-Bismuth-Iodide.

During 1926 the combined treatment has been given to 22 cases, 3 grains of emetine-bismuth-iodide being given every night and yatren (200 c.cm. of 2½ per cent. solution) lavages in the morning. To our surprise this seemingly drastic treatment was well tolerated by the patient, and the usual diarrhoeic effect of emetine-bismuth-iodide when given alone was not observed. Vomiting was almost entirely absent.

From a clinical point of view these cases have been the most successful in a series of 153 proved cases of amoebic dysentery which we have quoted in this paper, especially when it is remembered that most of them were war infections of long standing and especially intractable to treatment. The following illustrative cases are worthy of record.

One patient had had uncontrolled dysentery for eleven years since his original attack at Gallipoli in 1915. He was given frequent courses of emetine and emetine-bismuth-iodide without avail. In May, 1926, when he was passing seven stools daily containing free *E. histolytica*, he was given 27 grains of emetine-bismuth-iodide combined with ten daily rectal lavages of yatren, the treatment being controlled by sigmoidoscopic examination. He was in hospital for only sixteen days, and has been perfectly fit ever since.

Another patient first contracted dysentery in India in August, 1923; he had numerous courses of emetine and emetine-bismuth-iodide in India. In September, 1925, he was treated in a London hospital with emetine; relapses were frequent. On admission to the Hospital for Tropical Diseases in February, 1926, he was passing ten stools daily containing blood and mucus with free *E. histolytica*. He was treated with yatren alone, but relapsed one month later; he was then given emetine-bismuth-iodide combined with yatren in two courses, with an interval of one month. At the beginning of 1927 he was absolutely free from symptoms.

A third patient contracted dysentery in 1926 in Colombia. Numerous injections of emetine and courses of emetine-bismuth-iodide were administered, with only temporary relief. He was treated in various London hospitals without success. In October, 1926, he was passing sixteen stools daily with numerous free *E. histolytica*. He was then treated with emetine-bismuth-iodide, 3 grains at night (total 30 grains), combined with ten yatren lavages. Frequent sigmoidoscopic examinations were made. He has been free from symptoms since the cessation of the treatment (May, 1927).

As we well recognize that great caution is required in estimating the value of any particular line of treatment in such a chronic resistant infection as amoebic dysentery, and remembering that similar positive assertions were made about emetine and emetine-bismuth-iodide at the time of their introduction to the profession, we have refrained from quoting any which have been treated in this manner during the last nine months; otherwise our series would be much larger.

The combined treatment has much to be urged in its favour. It has, we think, been abundantly demonstrated that both these drugs possess a definite curative value in amoebiasis, which may be limited in its extent when they are used singly, but is much more intensive when both are combined. We do not think there is any doubt from our observations that yatren is widely absorbed, but it may be that it can only reach the amoebic lesions situated in a limited area of the large bowel, and so extensive lesions in the caecum and ascending colon may escape. These lesions and their contained parasites are thus reached by the emetine-bismuth-iodide given by the mouth. Moreover, as the treatment is continuous both by day and by night, the parasite is given no chance to recuperate. Whatever may be said about the rationale of the method, the combined drugs are remarkably well tolerated, and the results, as controlled by the sigmoidoscope and backed up by clinical observations, are very satisfactory.

In order to be efficacious, emetine-bismuth-iodide must be prescribed and administered in the proper manner. It is useless, in our experience, exhibiting it in pill or stearet form, as is frequently done, since it will be passed out of the bowel unchanged. If covered closely with any protective substance the drug is not absorbed. When given as recommended here it is more nauseating, and is apt to produce its most disagreeable effects. The red powder should be enclosed in a gelatin capsule.

If the full dose is to be tolerated it is better from the point of view of the patient to take one capsule containing 3 grains of emetine-bismuth-iodide rather than three capsules containing 1 grain each. The usefulness of the smaller sized capsule is that the dose can be graduated, and in sensitive persons and in women it is better to commence with smaller doses—1 grain for the first night and 2 grains for the second, so as gradually to accustom them to this drug. Some people cannot tolerate more than 2 grains. It is most important to observe certain precautions in giving the drug. The patient should have had no food or drink for four hours beforehand, and should be absolutely at rest when swallowing the drug. He should endeavour to go to sleep, and any saliva should be wiped from the mouth and not swallowed. Should vomiting ensue within two hours of giving emetine-bismuth-iodide the drug will not be absorbed. In these cases it will be necessary to give 10 minims of tincture of opium about half an hour beforehand. Generally this salt is best tolerated at 10 p.m., though in some cases it is useful, in order to avoid a restless night, to give it earlier—at 6 p.m. When given at 10 p.m. the last solid food should be taken at 4 p.m. and a glass of milk permitted at 6 p.m. Hot applications or sinapisms to the epigastrium are useful in prevention of vomiting due to the liberation of the drug from the capsule.

Sigmoidoscopic Appearances.

In connexion with this investigation on treatment an intensive study has been made of the sigmoidoscopic appearances of the bowel in amoebic dysentery to supplement previous work of one of us on this subject.[4]

A knowledge of the changes undergone by the bowel in all stages is, of course, indispensable in the diagnosis of intestinal amoebiasis and affords an index as to the cure of the disease by any particular drug or combination of drugs. The lesions differ considerably from those commonly seen on the *post-mortem* table. They are much more minute, delicate, and superficial, so that all the niceties would necessarily be lost at a grosser *post-mortem* examination. The sequelae of amoebic dysentery and the appearances of the latent stage are, perhaps, the most interesting. In the very acute stages the more dramatic appearances are observed and their fulminant nature must be seen to be realized.

In the most acute stage the superficial nature of the destruction of the mucosa more resembles that of the bacillary disease. The mucous membrane is covered with patches of ragged superficial ulceration and dotted with numerous bleeding points and fissures. The bowel surface is much folded and reticulated. When scrapings are made from this haemorrhagic surface, entamoebae are present in masses over the affected area. The lesions extend, as a rule, down the rectum right to the internal sphincter, and are easily visible directly the sigmoidoscope is inserted into the bowel, while the entamoebae may be demonstrated in scrapings taken at random from the mucosa, as in artifically produced intestinal amoebiasis in the cat.

In the subacute stage of amoebic dysentery the bowel surface presents the same folded and reticulated appearance; the lumen is filled with blood-stained mucus; the amoebic lesions take the form of small yellow elevations filled with putty-like material which are probably small ulcerations communicating with the submucosa, while the more recent lesions are represented by small star-shaped haemorrhages in the mucosa. Scrapings from the ulcerated surface yield either scanty entamoebae or Charcot-Leyden crystals which, as J. Gordon Thomson has pointed out, often afford an excellent index of the amoebic nature of the infection.

Chronic Amoebic Dysentery.

Under this heading we have included those cases in which the more urgent symptoms of the disease are absent, and the patient is inconvenienced solely by irregularities of the bowels or by abdominal discomfort. These are just the cases in which the diagnosis is difficult or impossible from the physical examination of the patient or microscopic examination of the faeces for amoebic cysts. Definite ulcerations of considerable size and extent are visible; the ulcers may be superficial, involving the mucous membrane only, or deep and penetrating the submucosa. They usually have undermined edges, haemorrhagic margins, and yellowish or grey bases. On scraping the bases of these ulcers with a blunt spoon masses of amoebae may be recovered in cases where they cannot be found in the faeces.

Latent Amoebic Dysentery.

The sigmoidoscope is of the greatest practical use in the diagnosis of the latent stages of amoebic dysentery, and it is therefore necessary to be familiar with the somewhat elusive appearances of the bowel. In this case amoebic cysts can neither be found in the faeces nor can the organisms be recovered from scrapings of the lesions. The lesions take the form of yellow papillae on the surface of the mucous membrane; they are associated with the peculiar infolding or reticulation of the mucosa, or the surface of the mucosa may be studded with small pits or depressions which represent healed ulcerations. Intermingled with these, small flame-shaped haemorrhages are often observed. The most deceptive form of all is the one where the only lesions visible are faint and small submucous haemorrhages. The painless nature of the lesions as ascertained by sigmoidoscopy during the more quiescent stages of the disease should be emphasized.

Conclusion.

The lessons conveyed by the study of the different phases of amoebic infection, both in the acute and quiescent stages, should be utilized for the control of the treatment of the disease.

The changes undergone by the mucosa during combined emetine-bismuth-iodide and yatren treatment are rapid and striking. A healed bowel after treatment is one in which signs of amoebic activity are entirely absent, but where traces of former lesions are seen in the small depressions or pits which everywhere stud the mucosa, and with which the clinician should make himself familiar as representing a bowel cleansed of amoebic infection. No observations are yet forthcoming to show how long these small and almost microscopic depressions persist, but that they are diagnostic of latent or recently healed intestinal amoebiasis there can be little doubt.

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Discussion.

Professor C. A. Kofoid (California) said that study in his laboratory during the past nine years of over 4,000 cases of infection by *Entamoeba histolytica* confirmed the greater efficiency of emetine-bismuth-iodide and emetine periodide as compared with emetine, yatren, and stovarsol; the last two were useful adjuvants, and neo-arsphenamine was replacing stovarsol with advantage. For diagnosis he relied primarily upon the finding of cysts and the nuclear structure of mature cysts. He had been studying an amoeba which resembled the largest "race" of *E. histolytica*, and was generally present in the quadrinucleate stage in stools. It had clear pseudopodia in the motile stage, and showed, as its most diagnostic features, a single large lateral blob of peripheral chromatin on the nuclear membrane and the presence of eight chromosomes at nuclear division. In culture this amoeba had maintained its characteristic morphology and behaviour for long periods, in one instance for over a year. The name *Councilmania dissimilis* had been proposed, and the question of pathogenicity or harmlessness was not yet certain.

RETRO-MALLEOLAR TUBERCULOSIS CURED BY TUBERCULIN ADMINISTERED ACCORDING TO KOCH'S METHOD.

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WHEN the patient whose case is here described first came under observation he presented a smooth, soft, uniform, resilient swelling, an inch and a half in diameter, situated between the right internal malleolus and the heel.

The hollows at the sides of the tendo Achillis were filled up, and there was some fullness along the outer side of the foot. The skin was not affected, except for one or two papules and a small area the size of a threepenny-piece over the lower part of the swelling, where it was thin, livid, and boggy. There was no pain and no restriction of movement. There was no history of injury; the condition had developed gradually, with slight variations, during the preceding five years, in the last nine months of which an oval nodule about an inch in length made its appearance further up the leg, just above the top of the boot. The patient was a young farmer, 28 years of age, of good physique, and in good health, except for some digestive trouble and a rather considerable amount of incidental wear and tear. The case corresponded to a clinical form of local tuberculosis described by Dr. le Clado at the British Congress of Tuberculosis in 1901, under the title "Tuberculose rétro-malléolaire."[1]

The treatment adopted, not by itself ideally complete, consisted in the administration by subcutaneous injection of Koch's T.R., beginning with 0.0002 c.cm. and ending in the course of eleven weeks with a dose of 2 c.cm. The latter was believed at the time to be the full dose recommended by Koch, but, as a matter of fact, it is only one-fifth of his maximum dose, which is 20 mg. *solid substance*. The interval between the injections varied from two to ten days according to the dose, and the proportionate increase of dose was from double with the smallest to one-seventh with the highest. Toleration was very good, with the exception of one dose of 0.7 c.cm. T.R. administered three days after 0.3 c.cm., when too great an advance caused a sharp febrile reaction, which abated within twenty-four hours. The general health of the patient was well maintained throughout the series, and even improved. Reaction at the site of disease though distinct was mild, although after the last three or four doses there was considerable focal oedema, for which the position and movement of the affected parts may have been in part responsible.

Six weeks after completion of this treatment the upper nodule had practically disappeared, the mass between malleolus and heel had shrunk into a well defined rounded, compact lump, and the ankle had a much more normal appearance. It was clear that a specific curative effect had been produced, and it was noted in particular that, in accordance with Koch's description, by the time a dose of from half to one milligram had been reached there was distinct clinical evidence of an immunizing action. Ten weeks after the administration of the final dose the effect of old tuberculin was tested; 0.0015 c.cm. T.K. gave an indefinite result, 0.007 c.cm. four days later was negative, but 0.02 c.cm. administered after a further interval of seven days produced a sharp general reaction (temperature 102.4°), distinct but not excessive focal redness and oedema at the site of disease, and great inflammation at the site of injection.

It was concluded from this test that reactionable material still persisted at the site of disease, either as living bacilli or their pathological effects. As a matter of fact, there were both, for fifteen months later the skin over the mass between malleolus and heel broke down, giving exit to a necrosed malodorous plug about the size of a marble and having the appearance of coagulated white of egg, after which the edges turned in and this site healed soundly and permanently, though slowly.

The patient was now lost sight of for about five years. There was then a large area of chronic inflammation, over six inches in length by three in breadth, immediately above the former site of disease, and several small scrofulous openings represented the line of extension from below upwards. Evidently the infection had passed through the aponeurosis near the original site of the disease in the triangular space in front of the tendo Achillis and had spread upwards in the subcutaneous tissue. After a few preliminary doses of T.R., bacillary emulsion was given and used on the same intensive plan. The intervals were gradually increased from two days to as much as six weeks, and the dose was increased by fractions rather large at first but ultimately not more than a seventh to an eleventh up to a dose of 3.5 c.cm., containing 17.5 mg. solid and total bacillary substance. This process occupied fourteen months. Mild reactions at the site of disease occurred after the earlier injections, and gradual but obvious improvement went on thoughout the series, ending in complete permanent replacement of the disease by healthy scar formation nine weeks after the last injection. The scrofulous openings were scraped midway in the series without any decisive influence on the course of cure; on several occasions subsequent to the scraping fresh places within the affected area inflamed, broke down, discharged their contents, and healed up more or less slowly. With the exception of a little rest occasionally the patient carried out active duties throughout the series.

This case is published not as an example of ideal treatment, but as a definite instance of an undoubted specific curative effect of tuberculin, corroborative, so far as it goes, of Koch's teaching on the subject.

REFERENCE.

[1] *Transactions* of the British Congress in Tuberculosis, 1901, vol. iii, p. 648.

OVARIAN HAEMORRHAGE FROM RUPTURED BLOOD CYST.

BY

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THE account of two cases of severe ovarian haemorrhage in young girls (BRITISH MEDICAL JOURNAL, June 18th, *Epitome*, para. 667) prompts me to relate a case with similar features and doubtful etiology that recently came under my care.

A young unmarried woman, aged 22, was seen by me in consultation with her doctor about four months ago for acute abdominal pain which had begun during a game of golf the same day. She gave a history of lumbar ache and vague abdominal discomfort coming on after exercise during the last six weeks. Her periods had been regular, of four weeks' cycle, and the next was due.

The present attack consisted of cramp-like pain in the hypogastrium and right iliac fossa, associated with nausea and vomiting. The pulse was 98, and the temperature 100°. The right rectus was slightly rigid. The case resembled appendicitis.

Laparotomy revealed free blood in the peritoneal cavity, and altered blood of a thicker consistency and large clots filled the pelvic region. About a pint of fluid was removed. The right ovary was found to be replaced by a dark fleshy tumour, three inches in diameter, twisted on its pedicle, engorged, and ruptured across its centre. The right Fallopian tube was also deeply congested. The tumour and tube were removed and the peritoneum cleared of blood clot and debris as far as possible. Before final closure of the abdomen, the left adnexal region was examined, and the left ovary was found to be slightly cystic but otherwise normal. Convalescence was uneventful, and the menses appeared regularly and of normal duration.

Three months later I was called to see her again, late at night, for sudden onset of acute abdominal pain and vomiting which began earlier in the evening. The pain was again cramp-like and situated around the umbilicus and hypogastrium. The temperature was 97°, and the pulse 80. The symptoms pointed to either another ovarian catastrophe—on the left side—or commencing obstruction of the small intestine from adhesions. The latter appeared the more probable, and proved correct on opening the abdomen two hours later. A quantity of clear serous fluid welled out of the wound, and examination revealed the lower two feet of ileum deeply injected and twisted round a thin fibrous adhesive band between the intestine and the anterior abdominal wall. This was divided, but the volvulus appeared only partly relieved. A further search resulted in finding a second band higher up connecting the ileum and umbilicus. This proved to be a Meckel's diverticulum, the canal being patent at its junction with the ileum about two feet above the ileo-caecal valve. The remainder of the diverticulum, which was four inches in length, was merely a slender impervious cord. These bands being suitably dealt with, the gut gradually resumed its normal colour. The appendix, being engorged and congested, was removed at the same time.

The pelvis was now examined. The right adnexal region was clear of adhesions and showed a well healed cicatrix from the former operation. On the left side a tense, thin-walled ovarian cyst was found. It was freely movable, attached by a pedicle, and as large as a tennis ball. It was removed without difficulty. The patient made a good recovery. During convalescence she was given a course of thyro-ovarian endocrine compound, and various other therapeutics. So far, two months after the second operation, there have been no symptoms of artificial menopause. On the contrary, she is bright, vivacious, and of healthy appearance, whilst one short menstrual flow has occurred since the operation.

There are several features of interest in this case:

1. The pathological report of the solid tumour on the right side showed a mass of blood clot and granulation tissue. There were no signs of ectopic gestation, which could be discounted entirely in this case. The condition was probably due to a simple unilocular ovarian cyst that had been subjected to many twists and torsions with attendant haemorrhages, resulting in final strangulation and rupture.

2. The left ovary, though slightly cystic when first examined, had become completely degenerated and cystic in the space of three months, and had enlarged to about

three inches in diameter. It would doubtless have shared the same fate as the right ovarian cyst had it not been removed.

3. During this period, menstruation had been normal and regular.

4. The risk of intestinal obstruction was constantly present by reason of the Meckel's diverticulum fixed at either end like a bow-string. This danger became enhanced by the advent of adhesions following the ruptured cyst, the fluid being of a particularly gluey and fibrinous nature.

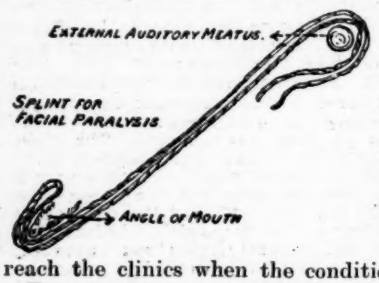
Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TREATMENT OF FACIAL PARALYSIS DUE TO EXPOSURE.

FACIAL paralysis due to exposure to cold, often in riding in an omnibus, is by no means rare; I have seen four cases during the last two years.

The great majority clear up quickly under the influence of salicylates and protection from cold by wool, but there are a minority which become chronic, one instance being a woman, aged 70, who had been afflicted since childhood. Undoubtedly such cases would decrease in number if precautions were taken to prevent the facial muscles from becoming stretched, a line of treatment adopted in other paralyses. In neurological and massage clinics suitable apparatus is used with this end in view, but frequently cases only reach the clinics when the condition has become chronic.



Two acute cases received salicylate treatment. In another patient a simple splint, made in a few minutes, was used in addition. A piece of covered electrical wire (not flex), about 15 inches long, was bent in the middle and covered with linen tape. The doubled end was bent in the form of a retractor, and inserted in the angle of the mouth. The free ends were carried round the ear in the manner of spectacles, and in such a way as to draw the angle of the mouth upwards and backwards. The device is worn as much as possible, day and night.

The patient volunteered the statement that articulation was easier with the apparatus in position and that it felt more comfortable. Recovery started six weeks later and was almost complete.

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TREATMENT OF ACUTE TRAUMATIC SYNOVITIS OF THE KNEE.

ON page 39 of the Army Health Report for 1925 it is stated that where there is no internal derangement cases of synovitis of the knee recover more quickly if treated by aspiration of the joint, repeated if necessary on several occasions. When this operation came into my experience re-aspiration was not found necessary, perhaps because my cases were but few, perhaps because they were seen early, perhaps because they were young; but, I venture to submit, it may have been because of the after-treatment by elastic pressure.

I was then serving in the *Excellent*, where there were many young officers and men going through courses of instruction, and it was urgent that any case of synovitis should be cured with the least delay possible. Consequently any joint that seemed to have more than half an ounce of fluid in it was aspirated, the puncture was sealed with collodion, and over that cotton-wool and an elastic bandage were adjusted, producing gentle and uniform pressure; the patient remained in bed, without a splint, though his leg might be swung, for two or three days. No patient was away from work more than seventeen days, and none had to be aspirated twice. In the first eight months of 1908, of the 15 cases of injury to the knee 3 went to hospital (2 with loose cartilages), 1 had a contusion of bone, and 11 had effusion—small in 6, who went to duty in fourteen days (average); 5 had more effusion and were aspirated (fluid 3½ oz. downward); they also returned to duty—4 in fourteen, 1 in seventeen days—but of course they were the more severe cases. The first time I heard of this elastic pressure treatment for a superficial effusion Mr. Chiene was telling us of a patient who, on the night before his wedding, boxing with a friend, got a nasty smack in the eye, and came to Mr. Chiene in great perturbation to be saved from an awkward disfigurement on the morrow. Mr. Chiene filled up the patient's orbit very evenly with cotton-wool, put an elastic bandage over, and next day the man was unmarked. Care is required in the adjustment, for haemorrhage occurs wherever in the orbit pressure is relieved by inequality in the packing. The method is most useful, too, in treating sprains, especially if they are seen early, when it prevents subcutaneous laceration of tissues and shortens the time of absorption; it is also useful after operation to limit oozing.

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Kew.

RETROVERTED GRAVID UTERUS WITH INTESTINAL OBSTRUCTION AND RUPTURE OF BLADDER.

THE following case appears to be worthy of mention on account of its rarity, the complication of anuria and enteritis, and the remarkably rapid improvement of the patient after the intravenous injection of hypertonic saline solution, and of ammonium chloride by the rectum as a preliminary to operation.

On December 15th, 1925, I was called to see a woman, aged 32, who was complaining of a sudden acute attack of abdominal pain, colicky in character and accompanied by vomiting. There was no previous history of gastric, biliary, renal, or appendicular trouble, and menstruation had been regular until four months previously; since then she had had no periods and thought that she was about four and a half months pregnant. The bowels acted regularly.

The abdomen was slightly distended and a tumour, dull on percussion, was felt above the pubes, passing down into the pelvis. There was no sign of free fluid. Per vaginam, the cervix was felt to be pushed forward towards the symphysis, and a fairly firm mass filled the pouch of Douglas.

The patient was admitted to hospital, and on vaginal examination under an anaesthetic the uterus appeared to be retroverted and fixed in the pelvis. An unsuccessful attempt was made to replace it. On recovery from the anaesthetic abdominal pain with vomiting continued, and distension increased. A few hours later the patient aborted a four and a half months' foetus, but abdominal distension continued and signs of free fluid were found, particularly in the left flank. As distension of the abdomen persisted and the bowels did not move with treatment, exploratory laparotomy was undertaken. The patient's condition at this time was grave, so 3 drachms of ammonium chloride in 5 oz. of water were injected into the rectum, and 10 oz. of a 15 per cent. solution of sodium chloride intravenously.

Operation.

The operation was performed under scopolamine and morphine and local anaesthesia with a little open ether; the peritoneal cavity was found to be full of clear fluid, which was mopped up and siphoned off. The small intestine was distended and obstructed by pressure at a point where the postero-inferior wall of the elevated bladder made an angle with the anterior wall of the retroverted and enlarged uterus. Here were some flakes of recent lymph, and here also was a small rent in the postero-inferior wall of the bladder, through which urine was passing into the peritoneal cavity. The intestine was easily freed undamaged and the bladder wall sutured. The abdomen was closed except for a rubber drain to the bladder area, and the uterus was brought up from its retroverted position. A catheter was left in the urethra.

For two days after operation the patient had complete anuria, and complained of intense thirst, after which urine was passed normally, but very intense and persistent diarrhoea developed and continued for four or five days, during which time she became very ill, but slowly improved and left hospital on January 22nd, 1926, the bladder and bowels acting normally. She has since been delivered at full term of a normal infant, after the newly pregnant uterus had again become retroverted.

Mr. Rutherford Morison, in *Abdominal and Pelvic Surgery*, mentions rupture of bladder with retroverted pregnant uterus as an emergency, and refers to the occurrence of enteritis following the accident as an extremely rare and dangerous complication. The development of

intestinal obstruction in this case was an interesting complication, especially as its site was at the point of rupture in the bladder.

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THE HOT BLANKET PACK IN PERSISTENT VOMITING.

ABOUT seven years ago I read in the BRITISH MEDICAL JOURNAL an article on treatments for cholera, ending with the remark: "On no account forget the hot blanket pack, especially in the case of children." Some time afterwards I was asked to see, in consultation, a boy suffering from uncontrollable vomiting, due to gastritis; the usual remedies had failed, and I recommended the blanket pack. The boy was wrapped in a warmed blanket, and to his body was applied a flannel compress previously wrung out of hot water to which mustard had been added. Food and medicine were stopped. In a short time he went to sleep, and an hour or so after waking was allowed sips of water, and, later, small quantities of liquid nourishment—milk and soda water, etc. I generally begin with sugar and water, and later give milk, with or without soda water, albumin water, and bovril, and usually by the third day a gradual return to full diet is possible. In some cases I have used linseed meal poultices with a teaspoonful of mustard added to the first, in place of the compress.

One case was unusual. A girl, aged 7, had been ill with chicken-pox for a week, and during the last three days had been unable to retain food or medicines, and had got into a critically weak state, with sighing respiration, great restlessness, and very feeble pulse. Within three hours of the use of the pack the whole outlook was changed and recovery assured. The next case was a lady who had both eyes operated on for glaucoma, the first with local, and the second, twelve hours later, with a general anaesthetic. When I visited her two days later I found the surgeon in attendance anxious because of persistent vomiting. I suggested the blanket pack and mustard compress, and had a cheerful note the next day to say that all went well afterwards.

So far I have not had a failure with this line of treatment, so thought it worth while passing it on as an effective and simple means of dealing with other troubles than cholera. In the case of a child one large blanket should be enough, in adults two might be used. In any case the object is to secure good surface warmth generally and counter-irritation over the stomach.

Keighley. JOHN B. BERRY, M.D.

POST-NATAL OSSIFICATION OF THE PARIETAL BONE.

As it must be comparatively rare for the membranes over a meningocele to ossify, the following case may be worthy of record.

On June 10th, 1927, I delivered a primipara of a male child. The presentation was a right occipito-posterior; the head rotated naturally after a somewhat prolonged labour, and the child was delivered easily with low forceps.

The caput appeared to be rather large, but at the time this was attributed to the prolonged labour. On the fourth day the "caput" was still present and was found to be a meningocele. It was fluctuant and translucent, situated at the posterior superior angle of the left parietal and measured 2 by 2 in., being raised about three-quarters of an inch above the surface. The edge of the bone could be felt as a sharply defined ring around the swelling. Apart from the deformity the child was in perfect health and weighed 8 lb. at birth. I naturally felt pessimistic and gave the parents a guarded prognosis.

On July 1st, when the child was 3 weeks old, a ring of bone a quarter of an inch wide had grown in around the margin of the opening. By July 8th the hole was only one inch across and by July 22nd was completely closed, the new bone forming a hemisphere over the swelling measuring approximately 1¼ by 1¼ by 1/4 in. It was quite hard, not translucent, and pressure on it caused the child no inconvenience.

The lesion seems to have been an exaggerated posterior fontanelle. The rapid ossification of the membrane was very striking and seemed to argue the removal of some factor which had prevented intrauterine ossification.

Norbury, S.W. W. EDWARDS, M.B., B.Ch.

Reviews.

A NEW TEXTBOOK OF PSYCHIATRY.

DRS. D. K. HENDERSON and R. D. GILLESPIE are conjointly responsible for a *Text-book of Psychiatry for Students and Practitioners*.[1] Though the subject-matter and its arrangement are naturally similar to those which are customary in manuals of psychiatry, this volume has a distinctive "atmosphere" of its own, and we feel that its authors have been justified in providing yet another textbook on mental disease.

The first chapter consists of an interesting historical review of the care and treatment of mental illness, and the second deals with classification. The authors point out that no attempt at psychiatric classification is entirely satisfactory, and consequently that "diagnosis," or the placing of the patient in an appropriate class is on an unstable foundation. It is not diagnosis which matters, however, but the understanding of the disorder, and the patient who suffers from it—under what circumstances it arose, how it is related to the patient's normal condition, what the disorder means, what light is shed on his problems, and what can be done to help towards a favourable outcome. The authors—with considerable justification, it would seem—renounce the rigid notion of disease entities, speaking of the different types of mental disorder as different "types of reaction." Disease, whether physical or mental, is not, as we know, an entity or "thing" with an independent existence of its own; it is a process—a reaction of the living organism to conditions which tend to disintegrate it. Thus general paralysis is merely a convenient term to include some of the reactions which result from the action of the syphilitic virus upon the organism. It is only one of the many types of reaction which may be exhibited, for the nervous system may be affected in numerous ways without adversely influencing the psychic reaction, and when the latter is affected, as in general paralysis, the clinical forms of this malady are infinite in their variety. It is in mental diseases particularly that we observe how variable are the reactions of the living being to the same noxious influences.

The scheme of classification adopted in this volume is simple but adequate. After chapters dealing with etiology, method of examination, and general psycho-pathology, we are given a clinical description and modes of treatment of the affective (manic-depressive psychosis, and involutional melancholia), schizophrenic, and paranoid reaction types. These are followed by chapters on mental defect; psychoneuroses; and the psychoses and psycho-neuroses of war. The volume includes a practical account of occupational therapy, and also a chapter on psychiatry and the law. The latter includes an account of the law in Scotland relative to the admission of voluntary boarders and certified patients into mental institutions.

A valuable feature of this book is the large number of clinical records of the writers' own cases. In their preface they state that they have done this for the following reasons: since mental illness is an individual affair, its symptoms have but little meaning apart from the setting in which they occur. This setting includes not only the general mental and physical condition at the time, but the individual's personality, circumstances, and history from his earliest days. Hence general descriptions of clinical syndromes, while interesting, are not of the first importance. What is wanted always is an understanding of the patient as a human being, and of the problems which he is meeting in a morbid way.

Unfortunately, many psychiatrists feel, the main "problem" which the psychotic patient has to face is a morbid change in his organism—in the depths of his organic life—which manifests itself by morbid irruption into his psychic life. This morbid change—the patient's problem—he certainly cannot control, and he is even unaware of its existence. In only too many cases the

[1] *A Text-book of Psychiatry for Students and Practitioners.* By D. K. Henderson, M.D.Ed., and R. D. Gillespie, M.D.Glas. Oxford Medical Publications. London: Milford, Oxford University Press. 1927. (Demy 8vo, pp. x + 520. 18s. net.)

psychiatrist also is unable to control or prevent the morbid events taking place in the organism, and our knowledge of their nature is still very meagre. Hence our relative incapacity to apply precise therapeutic remedies in the biogenetic psychoses, and the urgent need for continued biological research.

The views expressed in this admirable volume are largely inspired by the teaching of Professor Adolf Meyer. Due acknowledgement is made by the authors, who have dedicated their book to this eminent American psychiatrist.

SURGICAL ANATOMY.

THE appearance of a third edition, apart from three reprints, of a *Manual of Surgical Anatomy*,[2] by Mr. BEESLEY and Professor JOHNSTON, within the short period of eleven years affords unimpeachable evidence of the high esteem in which the book is held. Its success is in no way surprising, for in scope, in clarity of expression, and in accuracy of statement it leaves little to be desired. In view, however, of the important position it has obtained among students' textbooks and of the certainty that further editions will shortly be required we propose, while recognizing the manifold merits of the work, to point out certain small details to which we venture to take exception.

We see, for instance, no necessity to represent the relationship of the tendons of the flexor sublimis digitorum in Fig. 31 inaccurately, diagram though it be, and we consider the term "middle palmar space" puzzling and meaningless, unless both the thenar and hypothenar spaces are mentioned. In Fig. 82 the perinephric fascia and the fascia over the psoas of one side are shown passing across the middle line to become continuous with the corresponding fasciae of the opposite side in a way to suggest that disease on one side would almost inevitably spread to the other. On page 277 these two fasciae are, to say the least, not clearly distinguished, a view which, unfortunately, is confirmed in Fig. 83. On page 315 the cystic artery is stated to cross in front of the common hepatic duct, a relationship which we believe to be the exception rather than the rule. On page 271 the *sessile* hydatidiform body of Morgagni is alone mentioned. In the account of the lymphatics of the mammary gland nothing is said of the lymphatics of the nipple, while among the areas drained by the superficial inguinal glands the body of the uterus fails of recognition. More important omissions affect the sphincter round the common biliary and pancreatic ducts (Oddi's) and the various sphincters of the alimentary canal, other than the pyloric and ileo-caecal. With the exception of Jackson's veil no mention is made of the occasional peritoneal folds found passing between neighbouring abdominal viscera, of which some five or six are now recognized. The site for injecting the second division of the fifth cranial nerve is given, but those for the first and third divisions are ignored. Turning from such details to a matter of more general character, we consider the book would gain considerably by a less rigorous exclusion of physiological reference. The authors apparently are not unaware of this, for in the section dealing with the sympathetic and parasympathetic systems they depart in some measure from their self-imposed rule.

The book naturally invites comparison with the other English textbook on the subject—namely, Treves's—but it is a comparison into which we prefer not to enter. Each book will no doubt have its own adherents, perhaps in equal numbers. We will content ourselves with saying that in our opinion Beesley and Johnston's manual leans more to the anatomical side, Treves's more to the surgical side of the subject. In one important respect—namely, in illustrations—the former book is far superior, the skiagrams of the abdominal region being of quite special excellence. In conclusion, we would say that the book is well on its way to becoming—if it has not already become—a standard textbook; it reflects the highest credit on its authors.

[2] *Manual of Surgical Anatomy.* By Lewis Beesley, L.R.C.S.Ed., and T. B. Johnston. Third edition. London: Milford, Oxford University Press. 1927. (Cr. 8vo, pp. xiv × 563; 166 figures. 18s. net.)

THE ENGLISH PUBLIC HOUSE.

MR. ERNEST SELLEY remarks that it strange that no one has yet attempted to give any comprehensive survey of the public houses of the country. They are much talked of, often with lurid epithets; many who comment on them would appear to have little or no knowledge of them personally. He therefore set himself to learn their character first-hand. He spent two years on his investigations, visited many types of towns and country districts, and from his experiences has produced a very readable and informative book, *The English Public House as it is*.[3] There are over 80,000 public houses in the country licensed by the justices for the sale of intoxicating liquor. The public house is more than a shop: it is a place where people tarry for social intercourse as well as for refreshment. They tarry in a fashion that no one does in a teashop. Yet the history of the licensing laws shows that successive generations have regarded the public house as a potential danger to the public well-being. The Privy Council in 1604 said, "ale-houses and victualling houses ought to be no more than a number competent for the receipt of travellers, and for the supply of wants of poor people not able to provide for any quantity of victual for themselves (which are the true and natural use of these houses)."

Public houses, formerly owned by tens of thousands of separate individuals, are now so far as nine-tenths of them owned by a comparatively small number of brewery companies. They are multiple shops. As business organizations, to judge by the balance sheets of the companies, they are highly successful. As a firm of stockbrokers put it, "In good trade or bad trade, whether there is a strike or whether there is a lock-out, the brewer always makes money." The manager of a house may be good from the public point of view or from the trade point; the two are not synonymous. An undesirable back-street house is often a better commercial proposition than a more up-to-date house in a main street.

Mr. Selley's experience convinces him that the overwhelming mass of the people who use the public houses (and they form well over half the adult population) is not in the least besotted or degraded. The bulk of its patrons seek companionship. Generally there is good feeling both sides of the bar. There is companionship, refreshment, enjoyment, warmth, and light. A man seeks his "set"; they talk on things that interest them—even Bernard Shaw and the relative values of paper and sterling! "The 'pub' is the working men's club"; but there is evidence of a demand for a better club in the increasing number of clubs in towns, some of which have definitely come into being because of discontent with certain public houses. Drunkenness is mainly seen at week-ends when there are funds in the pocket and a greater concourse in the public houses. The Saturday night swilling is difficult to account for on any rational grounds in civilized communities. Statistics of drunkenness the author finds unreliable as a basis for argument. The methods of the police vary in different parts. He cites some examples. The following is a good one: Hartlepool has one licensed house for every 362 people, Middlesbrough one for every 757; yet the number of charges for drunkenness per 1,000 people in Middlesbrough in 1924 was seven times that of Hartlepool.

Public houses vary greatly in type. Some are frequented by definite groups. Men meet for business or market purposes. Some have a name for being frequented by bookmakers, others by loose women. If these are disturbed by the police the customers flit to fresh quarters. As taverns, for the supply of food, there is still much business done, particularly in market towns and in great centres of population. Some, by supplying good food at rates that undercut local restaurants, attract a large custom and pay well, on the policy of sacrificing the sprat to catch the whale. Others have developed a social side; the house has a bowling green or a quoit pitch. It may be the headquarters of a football club, pigeon club, cycling club, or the like. Entertainment clubs are formed and have their headquarters in the public houses. Large numbers of trade union branches hold their meetings in public houses, which

[3] *The English Public House as it is.* By Ernest Selley. London: Longmans, Green and Co., Ltd. 1927. (Demy 8vo, pp. v + 184. 5s. net.)

give rooms for meetings free of charge. The local institutes which make a charge of 5s. for such facilities are beaten by the public house, which takes its pay in other form. The author visited many evening entertainments, as one of the company, and describes his experiences.

"True the entertainments bordered on the verge of profanity and much of the patter was very suggestive. . . . These people love community singing. A chorus about 'I know she loves me, because she told me,' was sung again and again with great spirit. There was no doubt that while singing these people were happy. Their faces were transformed and their eyes shone with delight. Trouble and suffering had made their mark on the faces and bodies of many of the women. . . . The only beautiful things about most of them were their eyes during the singing. Their voices were not pretty, but their eyes were like jewels. . . ."

Where no music licence is allowed the wireless has made up for the lack. In one of the best houses in the Potteries which had no music licence the barmaid said, "We don't want one now, it would attract the 'riffraff.'" But there is a wireless behind the bar. The barmaid said that on Sundays the customers like to hear the church service. "They simply love to hear the hymns and sermon, and they sit absolutely quiet while it is on." There are signs that the village public house is deteriorating. Much of the former Saturday night custom goes into the small towns; the motor bus is responsible for this, and the attraction of the "pictures." In isolated villages they are as much a part of the established order of things as the church, and it is no uncommon thing to hear a maudlin Saturday night vocalist singing lustily in church on Sunday morning.

The author notes defects and abuses, the demand for reform, the experience of the Carlisle scheme, efforts of reform by "the trade," the growth of the public-house habit among women. He asks the question, "Have public-house habits improved?" He is very cautious in his reply. It is, he says, difficult to get a fair criterion of what former conditions were. While he finds general agreement that there is better behaviour and less excess nowadays, very few would commit themselves to the assertion that the number of people who take intoxicants in public has decreased. In his opinion the greatest checks on excess have been restricted hours of opening and high prices. These two factors, combined with a lower average specific gravity, have assisted in producing a measurable decrease in the amount of drunkenness. Longer hours and lower prices, other things being equal, tend to increase consumption and drunkenness, though perhaps not in the same proportion as formerly.

On the larger questions of policy his conclusion is this: "The community has seen fit to restrict this business and limit its power to injure by means of laws and regulations, but until the great pushing power of private profit-making has been removed the community cannot expect to be master in its own house." It is a book to read.

THE NATURE OF DISEASE.

PART I of Mr. J. E. R. MCDONAGH'S *Nature of Disease* was fully reviewed in these columns on its appearance three years ago (November 29th, 1924, p. 1008), and now he has brought out Part II,[4] which in due course is to be followed by another dealing with intestinal auto-intoxication and chemotherapy, the genesis of cancer, and other problems, and correlating with medicine recent psychological work and Mr. F. M. Alexander's views on the conscious control of the individual.

The present instalment, the appearance of which was delayed by the destruction of the type by fire, is therefore part of an encyclopaedic work, and commands respect for the author's imagination, enthusiasm, and energy. The difficulties of judging fairly the future possible applications of physical chemistry to medicine are very great in the present state of medicine, but important modifications in the basal conceptions of the mechanism of life and disease must be imminent in the light of the advances in connexion with the constitution of the atom and the electron. In the first chapter Mr. McDonagh considers the characters and changes which the protein particles in the plasma undergo in disease. These are summed up as (1) dispersion leading to coagulation, and (2) condensation, with subgroups of (*a*) hydration and (*b*) dehydration and gelation. The next chapter details the influences of the changes in the protein particles on the concentration of water and inorganic salts in the blood; hydration, or gelato-hydration, leads, it is said, to hydraemia. It is maintained, further, that when undergoing gelato-hydration the protein particles become precipitated in any one or more of the four important viscera in the following order—kidneys, brain, lungs, and liver; damming up of the glomeruli causes parenchymatous nephritis and profound hydraemia and oedema, and the author is firmly convinced that the so-called chloride retention has not anything to do with oedema. Anhydraemia is the result of dehydration of the protein particles which become soluble, thus increasing the "solid" contents of the plasma; this, it is said, leads to hardening of the capillary walls and interstitial changes, arteriosclerosis, and fibrosis of the viscera. In later chapters the changes in the vascular system and in the viscera resulting from alterations in the state of the protein particles are considered in detail and, as elsewhere, illustrated by cases. The genesis of cancer, considered in Part I in three chapters, is again submitted to critical analysis in the light of Gye and Barnard's work, and the somewhat remarkable conclusions are drawn that that work favours the non-parasitic rather than the parasitic origin of cancer, and that "the cause of cancer will never be found because as an entity it does not exist."

The concluding chapter of ninety pages is concerned with chemotherapy, organotherapy, and immunotherapy, which, it is held, increase the bodily resistance by subjecting the protein particles in the plasma generally, and in the leucocytes locally, to division and subdivision, thus augmenting the area of protective substance exposed to the invader, for it is regarded as certain that therapeutic preparations do not exert any direct action on invaders, their first action being always on protein particles in the blood stream. Further, it is laid down that no therapeutic substance acts primarily on a specialized structure; for example, "the sympathomimetic action of adrenaline is secondary to the dual action of conduction and dehydration exhibited by this drug upon the protein particles in the blood."

As was the case with Part I, the work is far from easy reading, and it is rather striking how very little reference is made to the researches of other writers within the wide area of subjects on which Mr. McDonagh touches.

[4] *The Nature of Disease.* By J. E. R. McDonagh, F.R.C.S. Part II. London: W. Heinemann (Medical Books), Ltd. 1927. (Cr. 4to, pp. 434; 1 plate. 21s. net.)

ORTHOPAEDICS OF CHILDREN.

THE volume entitled *Orthopedics of Childhood*,[5] like the others of this series, is intended for the general practitioner. It will probably be found by him to be a useful guide to modern methods of treatment of deformities in childhood. The title would have been pleonastic when orthopaedics were restricted to the etymological meaning of the term, as used by its inventor, Andry.

Dr. WILLIS CAMPBELL is known as a capable surgeon, well acquainted with his specialty, and this book will not do him or the University of Tennessee discredit. In his preface he expressly disclaims any pretensions to a complete representation of the literature or of the evolution of this vast subject. "The object of operative method alone is considered, consequently many standard procedures are barely mentioned or omitted."

With the limitations above implied, this book will doubtless be found useful. Unlike surgeons of the Boston school the author scarcely mentions posture or the supposed results of faulty posture. There are many illustrations, but some of the reproductions of photographs are by no means satisfactory.

[5] *Orthopedics of Childhood.* By Willis C. Campbell, M.D., F.A.C.S. Clinical Pediatrics, vol. vi. New York and London: D. Appleton and Co. 1927. (Roy. 8vo, pp. xxix + 311; 211 figures. 16s. net.)

One of the drawbacks of a series such as this, to which Professor FOOTE's *Diseases of the Bones, Joints, Muscles and Tendons*[6] also belongs, lies in the difficulty or even impossibility of avoiding overlapping of subjects. We find in Dr. Foote's volume articles on quite a large number of subjects which are also treated of by Dr. Willis Campbell. This may be accounted for by the statement in Dr. Foote's preface that his book "treats of disease as affecting these tissues and structures from the point of view of the physician rather than that of the surgeon." Certainly the paucity of details of surgical treatment bears out this statement. We believe that any attempt to divide orthopaedists into physicians and surgeons is wrong. The orthopaedic surgeon should above all be, in the words of Jonathan Hutchinson, "a physician who operates," and the establishment of two points of view can only be bad for the patient. Everyone who treats Pott's disease, for instance, uses fresh air and sunshine and good food as well as jackets and extension frames, and all surgeons give cod-liver oil for rickets as well as applying splints or the osteotome. The outlook for the practitioner is gloomy if he is to find himself obliged to study two works on every surgical subject—one written from the physician's point of view and another from the surgeon's. Many subjects are considered in this volume which, as far as we know, are not susceptible of any so-called medical treatment. What, for instance, is the medical point of view in the treatment of congenital and developmental anomalies of bones, or of congenital defects such as dislocation of the hip, talipes, cleft palate, and supernumerary digits, to mention a few conditions? On the other hand the article on rickets contains a great deal of information on the present state of opinion on the etiology of this disease, although the author seems not to find it necessary to quote recent British investigators of this subject.

NOTES ON BOOKS.

THE importance of scientific method in malaria survey work has sometimes been neglected, and factors of first-rate importance have not been recognized. One of these—namely, the enormous loss of time and labour involved in hatching out larvae of anophelines as a preliminary to identification—has received attention by Drs. STRICKLAND and CHOUDHURY in *An Illustrated Key to the Anopheline Larvae of India, Ceylon, and Malaya*,[7] which is a sequel to the *Short Key to the Adult Anophelines* by the senior author. It deals, therefore, with larval forms, methods for their collection, transmission, preservation, and examination, and contains a key to the identification of the oriental species, some fifty in number. In appendices reference is made to the necessary equipment and staff, the recorded geological distribution of the species, and the commoner habitats of the larvae. The book will prove of great value to all those engaged in malaria survey work.

Tuberculosis,[8] by BALDWIN, PETROFF, and GARDNER, deals chiefly with the bacteriology and laboratory diagnosis of the disease, and is intended to serve the needs of teachers, students, laboratory investigators, and technicians in tuberculosis institutions. The chapters devoted to the acid-fast group of bacteria, the biology and diagnosis of *B. tuberculosis*, experimental tuberculosis, pathological anatomy, serum diagnosis, tuberculin and experimental therapy, describe the procedures which the authors have found the most useful, and should prove of special value to laboratory workers. The book is excellently illustrated with numerous original drawings and photographs and four coloured plates.

Dr. G. O. LOTSY's book on *The Radiographic Diagnosis of Bilharziasis*[9] is a collection of skiagraphs showing the infiltration of calcified bilharzial eggs in the bladder, uterus, and kidneys, accompanied by a discussion in French, English, and Arabic on the parasites, the infiltrations, and the differential diagnoses—more especially from urinary calculus. The photographs have been made mostly from cases sent to the author for examination for suspected calculosis. The cases are discussed in detail, and the photographs are interleaved with explanatory diagrams. The statements about the parasites in the introduction are scrappy, but the volume should prove of considerable value to those interested in radiology, especially in a country such as Egypt, where two-thirds of the population are infected.

It is often said, particularly in introductory addresses at this season of the year, that it is a good thing for a medical man to have a hobby. Mr. JOHN W. WEIR, helped perhaps by the clear skies of South Africa, has found a hobby in astronomy, especially in the study of comets. Like others before him, he is puzzled to account for the constant form a comet maintains, and in a book, *Comets and the Sun*,[10] he has put forward a theory which would attribute the form to the presence of an envelope. The study of comets led him to consider theories and known facts with regard to the sun, and he has a chapter on the solar origin of the planets. The book is beautifully got up; it is a quarto, and its form has no doubt been selected in order to make possible the reproduction of a number of large photographs—some of them lent by eminent astronomers—of comets and of the sun; they are extremely well presented. One of them, in colour, of a great scarlet solar prominence is very striking. The frontispiece is a photograph of Halley's comet, lent by the late astronomer at the Cape, and on another page there are four photographs of the same comet taken at the Transvaal Observatory in 1910. We have no doubt that the book will be found of interest by those among our readers who are attracted to the study of the heavens.

To *The Tibetan Book of the Dead*,[11] which the Oxford University Press has published (price 16s.) for Dr. W. Y. EVANS-WENTZ, belongs the respect which attaches to a writing looked on as sacred by at least one part of a very large section of mankind. The title is no doubt correctly translated, but the scope of the book might perhaps be better conveyed by substituting "death" for "the dead." To read the translation itself, made by a Tibetan Lama acquainted with English, one must be something of an enthusiast; primarily it is a service to be recited to the dying; it fills 160 pages—nearly two-thirds of the volume. Dr. Evans-Wentz has written an introduction filling 80 pages, which is an essay on Buddhist doctrine. Sir John Woodroffe, Reader in Indian Law at Oxford, has provided a foreword giving an explanation of the doctrine implicit in the ritual; in the course of it he makes the observation that the fundamental difference between Christianity and both Brahminism and Buddhism is that the former teaches resurrection and the latter reincarnation. To those attracted by the study of what is sometimes called comparative religion the book will prove interesting.

[6] *Diseases of the Bones, Joints, Muscles and Tendons.* By John A. Foote, A.M., M.D. Clinical Pediatrics, vol. vii. New York and London: D. Appleton and Co. 1927. (Roy. 8vo, pp. xvii + 295; 76 figures. 16s. net.)

[7] *An Illustrated Key to the Anopheline Larvae of India, Ceylon, and Malaya.* By C. Strickland, M.A., B.C.Cantab., and K. L. Choudhury, M.B., D.P.H.Cal. With a foreword by Sir Ronald Ross, K.C.B., F.R.S. Calcutta: Thacker, Spink and Co. 1927. (Cr. 4to, pp. xi + 67; 12 plates. Rs.4/8.)

[8] *Tuberculosis.* By Edward R. Baldwin, M.D., S. A. Petroff, Ph.D., and Leroy Gardner, M.D. The Trudeau Foundation Studies, vol. ii. London: Baillière, Tindall and Cox. 1927. (Roy. 8vo, pp. xvi + 342; 82 figures, 4 plates. 21s. net.)

[9] *The Radiographic Diagnosis of Bilharziasis.* By Dr. G. O. Lotsy. Cairo: H. Friedrich and Co. 1927. (Med. 4to, pp. 90; 22 plates, 88 figures. 19s. post paid, or 90 piastres.)

[10] *Comets and the Sun. New Theories Regarding Their Structure.* By John W. Weir, M.D., F.R.C.S.Ed. London: Longmans, Green and Co., Ltd. 1927. (Demy 4to, pp. xv + 72; illustrated. 12s. 6d. net.)

[11] *The Tibetan Book of the Dead*, or The After-Death Experiences on the *Bardo* Plane, according to Lâma Kazi Dawa-Samdup's English Rendering. By W. Y. Evans-Wentz, M.A., D.Litt., B.Sc. With foreword by Sir John Woodroffe. London: Milford, Oxford University Press. 1927. (5½ × 9, pp. xliv + 248; illustrated. 16s. net.)

PREPARATIONS AND APPLIANCES.

A Standard Ether.

MANY years ago a distrust of ether as an anaesthetic became engendered in the public mind as well as among the medical profession. The suspicion was no doubt originally well founded, for in earlier days the finer degrees of purity, if not quite unknown, were more rarely attained; certainly no sharp discrimination was exercised between the purest and the ordinary. It is now known that all the defects peculiar to ether were due to a group of impurities some of which originated in the process of manufacture, others—such as peroxides—being generated through exposure to sunlight during storage. Echoes of the old distrust from time to time are, however, still heard, more particularly in the lay press. Popular prejudice may do much harm, and should be corrected at every opportunity. It deserves to be made known that in twelve years 500,000 pounds of ether for anaesthetic use have been supplied by Messrs. Howards and Sons without the report of any untoward event. Messrs. Howards and Sons are manufacturers of a highly purified ether for anaesthetic use, which they supply in amber-coloured bottles under the label of Howards' Standard Ether. We have examined a specimen analytically, with results confirming the makers' claims as to its purity.

THE STATE OF THE PUBLIC HEALTH.

SIR GEORGE NEWMAN'S REPORT FOR 1926.

ENGLAND AND WALES.

[Concluding Notice.]*

CANCER.

THE death rate per million of the population in 1926 due to cancer was 1,362 as compared with 1,336 in 1925, 1,297 in 1924, and 1,267 in 1923. The point is reiterated that these figures do not indicate an actual rise in incidence, but that important factors in the apparent rise are more accurate diagnosis, improved certification of the causes of death, and increased longevity resulting in a greater number of people reaching the age period of cancer than was formerly the case. It is suggested that the hope for the future lies in the discovery of some biochemical test which will render possible early and accurate diagnosis, together with the provision of some method of treatment other than surgical, and some etiological revelation which will open the way for prevention. Details are given of the work of the departmental committees, the main facts that have been established, and the reports that have been issued. The compilation and study of accurate records are mentioned as a desideratum, and reference is made to special efforts during 1926, such as the success of the Yorkshire Council of the British Empire Cancer Campaign in collecting money and founding the research centre at Leeds. The depth of the public interest was recognized practically by the British Medical Association, which devoted the Hastings Lecture for 1927 to this subject.

Tuberculosis.

Sir George Newman has still to complain that in some districts a considerable proportion of tuberculosis cases are not notified before death. The decline in the mortality of this disease continued, the number of deaths from pulmonary and other forms being respectively 30,108 and 7,417 in 1926, as compared with 32,382 and 8,005 in the previous year. The reports of medical officers of health show that in many districts accommodation for advanced cases remains inadequate, but more facilities have been introduced for dealing with surgical tuberculosis, and co-ordination has improved. The diagnostic value of *x* rays has been increasingly recognized, and the use of artificial light treatment for various forms of tuberculosis, including lupus, has been extended. There is more co-operation between general practitioners, tuberculosis officers, Poor Law authorities, and school medical officers. It is suggested that it would be well if the annual reports by medical officers of the urban and rural districts contained fuller information about the conditions in their areas as regards this disease in view of its preventability; there seems to be general agreement that unsatisfactory housing conditions play a large part in its prevalence. Mention is made of the sanocrysin and Spahlinger methods of treatment, and Sir George Newman regrets that in the latter case the complete serums and vaccine have not been available for a scientific investigation of their clinical efficacy by the Ministry of Health. Approved *x*-ray facilities have been provided by 37 county councils and 48 county boroughs under their tuberculosis schemes, and the value of radiography in diagnosis and in the estimation of progress is generally admitted.

Venereal Disease.

At the close of 1926 there were 190 treatment centres in England and Wales, with approximately 770 weekly sessions. A tabular summary of the returns from these centres for the last ten years indicates a slight decline in syphilis, but more cases of soft chancre and gonorrhoea were reported. The ratio of attendances to cases showed a further increase in 1926, implying a reduction in the amount of defaulting before the completion of treatment; this is attributed to the propaganda work of the British Social Hygiene Council and local authorities, and to the influence exercised by the medical officers at treatment centres. There is no evidence that the establishment of centres in special premises apart from general hospitals deters patients from attending. The suggestion is made that the reduction in the number of cases of syphilis would be more pronounced if there was not inadequate treatment by some practitioners, which results in relapse and the appearance of the patient at a treatment centre as a new case though not a fresh infection. It has been shown that the short course of six or eight injections of an arsenobenzol compound and mercury is followed by a high percentage of relapses. The importance of early diagnosis and treatment of syphilis in pregnancy and in congenital cases is emphasized.

Maternity and Child Welfare.

A striking feature of this section of the report is the conclusion that the general financial stringency of 1925 did not cause any appreciable physical deterioration in children. This is attributed to the special efforts made to sustain their nutrition by the provision of meals at schools, the increased amount of milk supplied to nursing mothers and infants, and the activities of the officers of local authorities and voluntary workers. More facilities are now being made available by maternity and child welfare authorities for consultations with specialists, institutional treatment, and nursing assistance in cases of puerperal pyrexia. The number of maternity homes and hospitals recognized by the Minister of Health, either directly or indirectly, for purposes of grant is: voluntary institutions, 81, with 1,423 beds; and municipal institutions, 68, with 857 beds. Emphasis is again laid on the importance of ante-natal supervision, and it is stated that there are now 772 centres for this, as compared with 675 in 1925; infant welfare centres have similarly increased from 2,195 to 2,324, but the large average attendance at these indicates that still more are required. There are now 3,963 whole-time or part-time officers engaged in health visiting, and a reminder is given that on and after April 1st, 1928, all health visitors appointed for the first time will be required to possess the certificate in health visiting approved by the Ministry. The case of the child between the ages of 2 and 5 remains a problem still awaiting satisfactory solution. As a result of the examination of nearly 1,000 children aged 3 in various parts of the country it was found that in 48.7 per cent. there were manifestations of rickets. Dental decay was noted in 24 per cent., enlarged tonsils in 21.7 per cent., and enuresis in 15.3 per cent. Sir George Newman refers to the international inquiry into infant mortality which was instituted by the League of Nations in 1926 with special reference to (1) immunization against diphtheria, scarlet fever, and measles; (2) the provision of instruction in pediatrics for medical students, nurses, midwives, and health visitors; and (3) the investigation in selected areas of different countries with regard to the causes of infant deaths. It is hoped that among other good results this inquiry will stimulate interest in child welfare among the more backward communities and lead to improvement of the prophylactic machinery.

The Insurance Medical Service.

The total population of England and Wales in 1926 was 39,067,000, and 14,102,000 persons were entitled to medical benefit under the National Health Insurance Act. The number of insurance medical practitioners was 14,432, and the average number of insured persons on a practitioner's list was 946. The total cost of medical benefit in the year was £8,621,638, of which approximately £6,592,900 was devoted to the remuneration of doctors, and £2,028,738 to the provision of drugs and appliances.

Regional Medical Staff.

The regional medical staff, consisting of fifty-one whole-time medical officers, dealt with 380,487 cases in 1926, as compared with 204,088 in the previous year. This large increase was almost entirely due to references by approved societies on the question of incapacity for work during the period of the coal stoppage.

*Our first notice of the Annual Report for 1926 of the Chief Medical Officer of the Ministry of Health appeared in the BRITISH MEDICAL JOURNAL, September 10th, p. 458.

Health Education by Insurance Committees.

It appears that 75 of the 128 Insurance Committees in England undertake health education work to some extent, and in 33 areas its scope may be termed considerable. The methods employed included public lectures, cinematograph and lantern demonstrations (21 committees); lectures by insurance practitioners to persons on their panel lists (12 committees); distribution of literature and publication of posters (42 committees); and participation in exhibitions and health week campaigns (25 committees).

Food in Health and Disease.

Sir George Newman throws doubt on the current view that primitive man was more favourably situated as regards his diet and nutrition than the man of the present day, but he admits that the diet of a considerable proportion of the population is not nutritious enough. He discusses critically various popular beliefs about nutritive values, and emphasizes the importance of milk and green vegetables. The gratifying progress that has been made in checking adulteration of milk and butter is shown by a chart; this is attributed not only to legislation, but also to a better informed and more determined public opinion. Reference is made to the possibility of arsenical contamination of apples and of glass fragments in food; the new regulations with regard to the use of preservatives have been actively applied. Numerous outbreaks of food poisoning occurred during the year, but none were on any considerable scale.

Scientific Investigations.

One department of the Ministry of Health is engaged in the collection from home and abroad of medical information, and arranging for its transmission to appropriate quarters; it collaborates closely with the Epidemiological Bureau of the Health Section of the League of Nations. In the Ministry's pathological laboratory the preliminary work on the serological classification of haemolytic streptococci has been completed, and a report published in the *Journal of Hygiene*, 1926, vol. xxv. The study of pneumococcal virulence and immunity is approaching completion, and forty-eight outbreaks of food poisoning were investigated during the year. Professor Topley and his assistants are continuing their study of the flora of the respiratory tract in the hope of elucidating some of the problems of epidemic influenza.

Artificial Light Treatment.

Increased provision was made during 1926 by local authorities for artificial light treatment in connexion with tuberculosis and child welfare schemes. An account is given of the results obtained by the use of various types of lamps. The importance of skilled medical and nursing supervision is emphasized, and the indiscriminate use of ultra-violet rays is strongly deprecated.

International Health Co-operation.

Sir George Newman devotes one chapter to the consideration of health questions from the international point of view, and describes the organization and work of the League of Nations in this respect. An international standard of potency has been established for diphtheria and tetanus antitoxic serums, and tuberculin has been similarly considered. Interchange courses of instruction for public health officers were continued, and have now been extended to Japan and West Africa; two special tours were arranged to maritime ports in the Mediterranean, the Baltic, and the North Sea. The weekly bulletin of infectious diseases in the East has proved very useful to the public health administrations concerned. The International Office of Public Hygiene in Paris has prepared a revised draft of the International Sanitary Convention of 1912, and has completed its work on the nomenclature of disease. Useful interchange of information has been arranged with regard to small-pox, scarlet fever, encephalitis lethargica, relapsing fever, typhus, and yellow fever. Details are given in this section of the report of the important international sanitary conference held in Paris during May and June, 1926, and reference is made to the valuable scientific papers read at the International Pacific Health Conference in Melbourne last December.

The Way to Personal Health.

Sir George Newman concludes his report with a very interesting and stimulating summary of the general health position. He indicates what the State is doing to stem disease and reduce premature mortality, and insists that a sanitary environment is the essential basis of all effective medical services. He shows that in spite of an enormous increase of population without enlargement of the home territory the total death rate and the infantile mortality rate of the nation have been halved within four generations. Moreover, the mortality of childhood is one-third of what it was eighty years ago, and the expectation of life for a child born in this country to-day is no less than seventeen years longer than it was for a child born in 1846. His brief but comprehensive account of the campaign against small-pox on page 261 of the report may be cordially commended to the attention of those exposed to the inquiries or criticism of the ignorant or fanatical opponents of vaccination; it provides a veritable armoury for the busiest medical practitioner. The preventive value of health insurance is similarly displayed, and the way to personal health is clearly and convincingly indicated. After showing how recent years have been characterized by many improvements in the public outlook on life, Sir George Newman ends his report with the following two sentences:

"These changes indicate an immense awakening and a wider use of the improved environment and health facilities which the State has provided. Much disease and impairment remain, but evidence and experience suggest that we are on the high road to their amelioration."

UNIVERSITY OF CAPETOWN.

NEW MEDICAL SCHOOL BUILDINGS.

[FROM OUR SPECIAL CORRESPONDENT.]

THE first of the two blocks comprising the new buildings for the medical unit of the University of Capetown, the foundation stone of which was laid by the Governor-General, the Earl of Athlone, on May 10th, 1925, has been completed and is now occupied. The buildings are situated near the Mowbray entrance to the Groot Schuur estate, at a distance of exactly one mile from the main university, which is now in course of erection on a site which can only be described as majestic in its surroundings and outlook. The medical school itself is distant some three miles from the city proper, from which it may be reached by two alternative routes—by the de Waal Drive, the mountain motor road skirting the foot of Table Mountain and the Devil's Peak, or by way of the main road leading from the city to its southern suburbs. The buildings of the medical school are quite close—to be precise, some two hundred yards—to the site for the new General Hospital, which is now being cleared and levelled on the slopes just below the de Waal Drive. The medical unit will thus be very closely associated with the hospital, an association which clearly is in the interests of the patients as well as of the research to be carried out in the several departments.

The block completed, to be known as the Wernher-Beit block, is from the design of Mr. Cleland of the public works department, and is in the shape of a double "E," with the central portion omitted on the western, or de Waal Drive, side. It is a stately and imposing building of stone and concrete, standing in surroundings that give promise of ultimately becoming a fine terraced park. The main entrance is from the de Waal Drive side and gives immediate access to the three floors—a basement, a ground and a first floor—which are readily reached by a central stairway. A feature of architectural interest is the central courtyard extending from the basement to the top of the building, which serves the dual purpose of lighting and ventilation. Opposite the main entrance, and occupying the middle projecting limb from the main horizontal

corridor, are the three lecture theatres, placed one above the other. On the first and second floors are the two main theatres, each with accommodation for about two hundred students. The seating is arranged in semicircular fashion on ascending tiers. The lecturer's desk is fitted with facilities for the demonstration of specimens, and behind it, on the wall faced by the audience, are double sliding blackboards and an adjustable screen for the epidiascope, one of which of the latest pattern is provided in each theatre. Ventilation is efficiently carried out by a system of powerful double-acting electric fans, by means of which a continuous current of fresh air is made to circulate through the room. In the basement below the larger theatres is a smaller one, the general arrangements of which correspond to the description already given. This is utilized by the department of medicine, the two larger serving the requirements of the departments of surgery, pathology, and bacteriology.

Pharmacology.

The department of pharmacology occupies most of one side of the ground and first floors. It comprises a lecture theatre, additional to those already described, with separate entrance for students from the main corridor, a practical laboratory in which a feature is the up-to-date draught cupboard, private laboratory for the professor, research laboratories, workshop, store rooms, and side rooms. The laboratories are splendidly equipped and contain the latest kinds of kymographs, pumps for artificial respiration, and the other necessary mechanical devices. Power is supplied from electric motors by means of belting to the main driving shafts fitted in each room. The brackets which carry the main driving shafts also convey the electric mains for lighting, gas and water pipes, from which supply points are arranged at frequent intervals. A room is set aside for an electro-cardiograph. Professor J. W. C. Gunn, who is in charge of the pharmacological unit, is the curator for the building.

Bacteriology.

The department of bacteriology is on the other side of the ground and first floors. It comprises retiring rooms and offices for the professor and his assistants, a private laboratory for the professor, a routine laboratory in which the clinical work of the general hospital will be carried on, vaccine preparation and media rooms, and a very large practical laboratory for students. This latter is, perhaps, the feature of the department, and is equipped in almost sumptuous fashion. It contains four rows of work benches running lengthways, divided into spaces on both sides of the bench allotted to each student. Each space is fitted with microscope, illuminating lantern, rack for reagents, and water tap. Suitable provision is made at one end of the laboratory for lecture purposes. The department, in addition, contains a mixing room, and has its own self-contained refrigerating plant situated in the basement, by means of which the various cool chambers are supplied.

Surgery.

The surgical unit, situated in the rearmost portion of the left wing of the building on the first floor, is ideally fitted and designed for its purpose. The rooms set aside for operative and experimental surgery are lined throughout with white glazed tiles. The former—the larger apartment of the two—contains four operating tables, the latter two. Each table is lighted by a cluster of lamps arranged under one shade working on an adjustable ball-and-socket joint. Very complete provision is made for cleansing purposes by means of water supply taps and sinks. These rooms would put to shame the operating theatres of many a modern hospital. Further accommodation consists of a professor's room, a private laboratory, specimen rooms, and a dark room fitted for the most up-to-date methods of colour photography.

Medicine.

The department of medicine occupies a series of smaller rooms in the basement adjoining the lowermost lecture theatre. There is provided private accommodation for the professor and his assistant, a dark room for photographic purposes, an electro-cardiograph room, and a laboratory for experimental medicine. In this section, too, there is a room intended for the use of the lecturer in public health, as well as a larger apartment to be utilized as a museum for the department of forensic medicine.

Pathology.

Perhaps the most interesting of all the departments is that occupied by the professor of pathology, which takes up the whole of the first floor and part of the basement in the right wing, connected by a covered way with the mortuary and *post-mortem* rooms, which form a separate single-storied block detached from the main building. In addition to the rooms set aside for the professor and his staff there is a spacious preparation room, where specimens will be received and prepared for examination. The students' practical laboratory, like that in the department of bacteriology, is a really magnificent example of what such a laboratory should be, and its equipment is of the finest and most complete description. Another feature of this department is the record room, where the facilities for storing and indexing of pathological slides have been designed by a master mind. Below each slide-filing cabinet is a series of drawers designed to hold the clinical history of the case from which each specimen is derived; by this means it will be possible to study the section of a diseased organ in conjunction with the medical history of the case. The mortuary block may justly be described as the "show section" of the new medical school. It would, indeed, be difficult to find in any similar institution a *post-mortem* room and adjuncts so beautifully designed and fitted for the peculiar local needs of a teaching hospital. In the *post-mortem* room the tables and walls are of pure white enamel, while the arrangements for ventilation and cleansing excite the admiration of even the casual observer. A special feature, however, is the refrigerating plant, which provides the cold storage necessary to preserve cadavers in a climate so warm and moist as that of the Cape peninsula. It is capable of effectively chilling ten large vaults that open on to a corridor leading to the *post-mortem* room. Each vault has storage for five bodies and has a special door at the back, which permits of a body being taken into a small waiting and viewing room, where friends and relatives can see it in private. In connexion with the mortuary is a chapel of dignified design with a separate outside entrance and ante-rooms. These rooms are so arranged that Europeans and non-Europeans are kept apart, besides having their use in case of denominations with special rites, such as the Moslems. In keeping in mind these small but important details, the architect has shown his comprehensive grasp of a scheme which provides such a beautifully designed mortuary unit. This unit will not be utilized until after the completion of the new general hospital.

Students' Common Rooms.

In conclusion mention should be made of the ample accommodation for students of both sexes in the shape of comfortable common rooms. These are fitted with lockers, keys for which are lent to students on payment of a small deposit. The common rooms are situated in the basement, where, too, there is a tea room. Lavatory accommodation throughout the building is more than ample, both for staff and students. Protection against fire is adequately provided by the installation at all strategic points of hydrants fitted with pressure gauges indicating the head of water available. The roof of the building is of tiles and the woodwork throughout of seasoned teak. The furniture in the majority of the rooms is in the characteristic South African style and made from stinkwood. This description would be incomplete if it omitted to mention the large modern animal house erected in the grounds, where the animals used for inoculation and the necessary experimental work are housed and cared for. Here again scrupulous cleanliness is the key-note and the facilities provided for that purpose are admirable.

TREATMENT OF INDUSTRIAL RHEUMATISM IN GERMANY.

[FROM A CORRESPONDENT.]

BY invitation from the German Ministry of Health a number of British medical men and twenty representatives of various industrial organizations attended recently the inauguration of a German Committee on Industrial Rheumatism in Berlin. The meeting, under the chairmanship of Professor Dietrich, was held in the clinic of Professor Bier: many papers and demonstrations were given, and a general policy was decided upon. Later a few British and Dutch physicians were the guests of the German Spa Federation (Allgemeiner Deutscher Bäder-Verband) at certain health resorts, that they might see on the spot what is being done for the insured patient since the war.

The British party was under the leadership of Dr. R. Fortescue Fox, chairman of the Rheumatism Committee of the International Society of Medical Hydrology, which recently met the representatives of the English approved societies to discuss the possibility of establishing a clinic in London on the lines of those already existent in such centres as Berlin, Dresden, Hamburg, and Aachen, for the treatment of insured patients. In former times the Krankenkassen (approved societies) had relied for the treatment of their chronic rheumatic patients on contracts with the various spas, of which there are well over a hundred in the country. Of late years, however, the number of these patients, and the expense entailed by sending them to the resorts, have increased so much that clinics were established at various places—often in connexion with a general hospital or university board, where balneological and physico-therapeutic treatment could be obtained for their members in the town at a much lower cost. For in-patient treatment several large hospitals have been established, notably at Aachen, which are said to provide sufficient accommodation for all needs. The patient whose invalidity lasts more than twenty-six weeks, however, is still given the opportunity of obtaining a "cure" at a spa, if the physician in charge of the case thinks that this offers a reasonable chance of alleviating the symptoms sufficiently to raise him from the category of permanent disability. He is then sent for a minimum period of three weeks—which may be extended to a maximum of six weeks—to one of the spas, where he is boarded at a low cost either by contract with the small hotels or, in many places, in a home run by the society for this purpose, the employers also contributing.

Sickness insurance appears to be much more far reaching in Germany, and every grade of the Civil Service (which apparently includes most people) is catered for at some or other of the spas. At Bad Elster, for instance, which is a State spa, there are homes for the workman, the clerk (and family), hospital nurses, State officials of "middle grade," army N.C.O.'s and officers; there is also a home for children. It is held to be important in this respect to consider the social customs of these various grades, and not to emphasize unduly the contrast between their usual surroundings and their spa environment. The patients are supposed to be under rigid medical discipline whilst undergoing the cure, but this seems to vary inversely as the grade of home.

TOWN CLINICS.

Hamburg.

The Barnbeck Hospital, completed in 1913, contains nearly 2,000 beds, has a department for balneological treatment and physico-therapy, to which is attached 200 beds, under the charge of Professor Plate. The great majority of the patients attending are rheumatic subjects, although other cases for which this type of treatment is suitable are referred from other parts of the hospital. The plans for this department were drawn up by a committee, under Professor Pfeiffer, consisting of physicians, surgeons, an orthopaedic surgeon, and an engineer in consultation with the architect. Original work appears to be carried out here in connexion with the treatment of the chronic rheumatic diseases, and the duration of sciatica, in particular, seems to have been reduced by means of Professor Plate's system of intensive treatment. It is strongly held at this centre that these diseases are largely occupational, and a cinema film was shown to corroborate this: there is, therefore, an advisory committee appointed to consider each particular patient on discharge, with a view to discussing the necessity for either modifying or changing his occupation. The insurance companies state that, in their opinion, this has reduced their total sickness payments of late years.

Berlin.

Two clinics were inspected in Berlin, the larger one being a special department of the great Virchow Hospital. It is under the charge of Dr. Laquer, and more than 200 patients are treated daily by the various douches, sprays, water baths, sand baths, mud baths, violet-ray baths, vapour and steam baths, hot-air baths, and "partial" baths with which the department is amply supplied. There is also an enormous "Zander" gymnasium, where the patients undergo the vigorous passive movements which characterize that system. The dozen or so unselected patients who were questioned seemed to have derived—from their own account—very considerable benefit from treatment, the duration of which had varied from four to twelve weeks; since all the treatment in this clinic is ambulatory, its duration, so long as any prospect of benefit remains, is not limited, as it is at the spas.

The other clinic (Victoriastrasse) is run entirely by the approved societies for their members, and was founded just before the "inflation" of the mark. The Government, however, later repaid all their investments in the stabilized currency, and the result is that these clinics are the most lavishly equipped institutions in Germany. Patients can be recommended by any general practitioner since there is no "panel," the insured person having the right to consult any doctor who has expressed his willingness to see this type of patient. If the recommendation is accepted the patient gets five treatments and, after seeing the director, returns to his doctor, who can order continuation treatment if he considers it necessary.

These institutions are mostly staffed by whole-time medical officers and assistants under a medical director, and are open all day and until late at night, for the convenience of patients who can only reach them then.

Dresden.

Saxony is the most strongly socialistic of the German States, and considers itself very progressive. Certainly the "Ortskrankenkassen" of Dresden is one of the most palatial modern buildings in the city. It comprises an administrative block, and large out-patient departments for the various types of treatment, a feature being the provision of a tiny wooden cubicle for each patient, in which he can undress. The balneological department is a single enormous room in which are some fifteen or twenty baths for the provision of every treatment of this kind. This would probably not be considered a satisfactory arrangement in England, but makes for economy in the number of assistants required, whilst the physician in charge can more easily exercise a general supervision. A large rest room adjoins this department, every patient lying down for half an hour after treatment. It appeared that the chief superintendent was not a medical man, a fact which, it is said, makes for continual friction, and since every case sent up by outside doctors is not, therefore, seen on arrival, the therapeutic facilities of the place are occasionally abused.

In addition to balneology there are departments for massage, Swedish gymnastics and Zander treatment, heat and light of all kinds, and electrical treatment, including high-frequency for the hair! There is also an advisory bureau for young men and women about to marry, which is advertised locally by means of rather lurid posters designed to point out the dangers of *not* consulting this centre. As the result of pressure from below the socialist authorities have included practitioners of the popular "Nature Cure" cult (Naturheilkunde) among their "panel" doctors, a state of affairs prevailing only in Saxony, and against which the profession are apparently powerless, especially since the doctors' "strike" some years ago, which revealed the fact that the "blackleg" was not a monopoly of the proletariat.

Wiesbaden.

Wiesbaden, although a fashionable watering-place, takes also a considerable number of insured patients, under a contract, and the recently opened Stadtischen-Forschungs institute, which is both a research institute and hospital, accommodates about a hundred in-patients, who are thoroughly investigated both bacteriologically and biochemically under the supervision of the director, Dr. Harpuder. The building was once an hotel, and has on the premises a warm saline spring, with a Roman tablet extolling its healing properties. Original work on the action of waters on the yeasts and ferments is being carried out in the excellently equipped laboratories, and it is interesting in this connexion to note that research is being supported by the

approved societies in most of their hospitals, though to a varying extent. Patients can be sent here for a three weeks' cure, which is felt by the staff to be too short, but may be extended to six weeks if no other claim has been made during the year by the patient. If no improvement is noticeable after this period the patient is graded by the hospital medical board, and can then go on to permanent sickness benefit. Both lower and middle class patients are treated here, but no distinction is made between them, since no room has more than two beds. The hospital is, in addition, well equipped to give other forms of treatment.

Mainz (*Mayence*).

The clinic inaugurated by Dr. Frank in this city more than twenty-five years ago has been the pattern for most of the clinics which have been described above, and from this point of view is well worth a visit, since even to-day there is said to be no essential point of design which it is felt could be improved upon. Only a certain proportion of the cases treated here are sent by the approved societies, the rest being private patients, who are graded, according to the amount they feel inclined to pay, into four classes. The director exercises a general supervision, but himself treats only those cases specifically referred to him.

Aachen.

Aachen (Aix-la-Chapelle) lies in a valley some six kilometres only from the frontiers of both Belgium and Holland. Its natural sulphur springs are, from the medical point of view, its greatest asset; they are amongst the hottest in Europe, and since Roman times have been frequented for the treatment of rheumatism and skin diseases, and, when combined with inunction, have long been used for patients suffering with the later manifestations of syphilis, particularly those intolerant of arsenic. Early cases are not considered suitable.

The Landesbad Hospital, founded in 1912 by the insurance organization of the Rhine provinces, is probably one of the best equipped institutions in Europe, and can accommodate nearly 400 in-patients, about a third of whom are women. Dr. Krebs is the director, and the medical staff is on a whole-time basis. No out-patient department is attached to the hospital, since the patients are sent direct by a medical board at Düsseldorf, which accepts also members of other friendly societies at a slightly increased rate of payment. The patient's third-class railway fare is paid if he has to come from more than a certain distance. The inmates are only allowed out of the building once a week, but a spacious garden is provided for them, as also frequent lectures, outings, and social evenings. A research department was opened during this summer under the general control of the Faculty of Medicine of Düsseldorf, and post-graduate lectures and courses are to be given during the winter.

SPAS.

The spa treatment of chronic rheumatism, although in use since the Roman era, has until recently been regarded with a certain amount of suspicion by the medical profession, owing in all probability to the largely empirical nature of the methods employed. This is presumably still the attitude of a minority of the profession in Great Britain. In Germany the subject was taken up from a scientific point of view at the beginning of the present century by men appointed by the universities and, as the result of their inquiries, the approved friendly societies decided to include spa treatment amongst their additional benefits—largely also, it is said, owing to the alarming increase in their dental payments for chronic arthritics! The societies in their recent reports state that they have arrived at the conclusion that this policy has paid, in view of the fact that one-sixth of their total invalidity results from this cause; a figure which, according to the Ministry of Health's recent report, also holds good in England. They further point out that the provision made for tubereulous subjects has always in the past been much more adequate, although the rheumatic patient predominates in the proportion of 8 to 1 (Zimmer).

A few selected spas of differing characteristics were visited by the British and Dutch physicians; a brief description of them follows in the order in which they were visited.

Oeyenhausen, which rather grandiloquently styles itself "the city without steps," is a small town, about one hour by train from Hanover; it is picturesquely situated in a valley between the wooded slopes of the Teutoberger Wald. It boasts five saline springs, heavily charged with carbonic acid gas, the chief indications for treatment being, therefore, rheumatism and nervous diseases; but heart disease is also treated on lines practically identical with those used at Nauheim. As a spa it takes itself seriously, and provides little in the way of entertainment other than an excellent band and a Kurtheatre. There are also the sedative delights incidental to fine buildings, and a well laid out Kurpark. The results claimed in rheumatic cases are good, although a repetition of the cure is advised even when apparently successful. At the Auguste-Victoria Children's Home nearby twenty-five post-rheumatic cardiac cases are treated for periods of four weeks all the year round on Nauheim lines, the carbonic acid bath being used largely. The treatment aimed at in the nervous cases is largely sedative, and is said to alleviate spasticity. The waters are given both externally and internally, by the latter method apparently with great frequency.

Bad Eilsen is two hours' journey by motor from Oeyenhausen. The road lies through the picturesque gap in the wood-clad mountains—the Porta Westphalica—out of Westphalia, and into the tiny ex-principality of Schaumburg-Lippe. The ex-prince, who is still wealthy enough to command the respect of the local democrats, has employed his leisure to build a colossal hotel, which is advertised as being a "Hostellrie of quiet refinement," and has partly furnished it from his Schloss. Adjoining this is a "model" bath house, in which the potent cold sulphur water, of which there is a most unusual amount in the vicinity, can be taken in any form—bath, drink, or inhalation; the last being given by means of the recently invented Italian method of using a dry vapour. Mud baths are also much used. For those who require less magnificent quarters there are two other large hotels, all three being run in conjunction with one another, and sharing the very delightful kurpark. There seemed to be no insured patients in Eilsen.

Bad Nendorff is said to owe its origin as a spa to the fact that Jerome Bonaparte was cured of his rheumatism after bathing in its four hot sulphur springs; it is largely owned by the State of Prussia, and is now used almost entirely for the treatment of insured patients, the establishment being open all the year round. For the most part the accommodation is unpretentious, and many are boarded out in the town, at an average cost of 5 marks a day; the cost of the cure, which lasts here four weeks, is extra. The expense of this is calculated on an average basis of twenty-one peat baths at a cost price of 4 marks each; but these baths may, if the patient wishes to economize, be used on three occasions at no extra cost; this is not, however, advised, since the therapeutic potency is said to suffer by reheating. The natural water here is stated to be of double efficiency in the treatment of the rheumatic, since, in addition to its strong sulphur content, it contains 6 per cent. of brine. It is for this reason also much used in the treatment of chronic respiratory disorders, chiefly by inhalation and vaporization, and of skin complaints. For the casual visitor Nendorff is not always a pleasant place, since the sulphurous fumes penetrate to all the bedrooms of the hotel, and strong men have been known to curtail their stay on this account. Drawbacks of this nature are, however, thought to be mitigated by the picturesque native costumes worn by the peasantry on Sundays and holidays, and by the hospitality of the residents.

Pyrmont, the next spa to be visited, is reached by a road which passes through the quaint little town of Hamlin on the river Weser, the scene of the famous "Pied Piper" legend of the thirteenth century. This is amply commemorated there by a tablet in the church, by the pied piper's house in the main street, and by scores of rats of all sizes, made in glazed brown bread with bead eyes, which are pressed upon one in shops of all sorts. There is also a tablet commemorating the reputed discoverer of morphine, who lived in this town. Pyrmont, which stands about 450 feet above sea-level in a valley well protected from north and north-east winds, was known as a spa in Roman times, when "sterility cures" seem to have been practised, and even now it is known principally as a "woman's spa." The water contains a high percentage of sodium chloride, and that from the chief spring, in addition, iron and carbon dioxide. Mud is obtained by light railway from a large lake nearby, and is said to be of exceptional potency. Pyrmont supplies its water in bottles by contract to some of the city clinics for insured patients, but is rapidly becoming one of the most popular watering-places in Germany, and consequently not very much is done for such patients on the spot. The general opinion throughout Germany appears to be that the presence of insured patients in any number has a detrimental effect on the spa from the social point of view, by keeping away many of the wealthier classes who would otherwise patronize it; accordingly, the trend of policy is to devote the smaller spas more and more to the service of the "Krankenkassen," whilst keeping the larger and better known almost exclusively for the use of the paying patient. Exceptions to this policy are made in many places, such as Wiesbaden, where considerable numbers of insured patients are treated in

their own institutions, and do not, consequently, take much part in the life of the place.

Bad Elster is a small State-owned spa, situated amidst beautiful forest scenery 1,000 feet above the sea. It is only twenty minutes from the Czechoslovakian frontier, and is thus brought into competition with the spas over the border in the neighbourhood of Karlsbad. It is consequently the cheapest of the German resorts. Its chief additional medical assets are a bracing but uniform climate, twelve alkaline saline springs—some of which also contain carbon dioxide (Marianquelle)—and two lady doctors. Mud (peat), iron, and pine-needle baths are used extensively; heart disease used to be treated here more than is now done, and an elaborate system of graduated walks exists up the neighbouring hillsides for the after-treatment of these cases. There is also an open-air theatre, restaurant, and dancing place. As has been mentioned previously, a very large number of insured patients are treated here annually, and homes exist for their accommodation; the average cost for a patient whilst living in a home and taking the cure is 3.50 marks a day, with a 20 to 100 per cent. reduction in the cost of his treatment and doctor's fees. The most palatial of these homes is for clerks and their families, but appears originally to have been established under a private bequest. The spa is not, according to Herr Etienne, the director, primarily run as a business proposition, only a small margin of profit being aimed at, since any renovations or building operations which may become necessary are undertaken by the State, which, in return, has the right to send 200 patients for free treatment and 250 at half-price every year. For his services the doctor, who is selected by the patient, receives 10 marks, and is required to see him twice. The cost to the spa is worked out on a basis per patient of twelve peat baths and six carbon dioxide baths, the former being by far the more expensive item.

Apart from the insured patient, Elster is also patronized to a considerable extent by the middle classes, who were particularly hard hit financially during the crisis in 1923, and a certain number of these patients are also able to get a reduction in their fees for the cure. This number is, however, limited, although not rigidly. No mention of Elster would be complete without reference to Dr. Köhler's magnificent sanatorium, which is equipped completely for the balneological and physical treatment of rheumatics, or to the tuberculous children's home, which he runs by means of voluntary contributions—amongst others, from the English "Save the Children Fund"—and which is a model for other homes of the sort.

From what has been said it will be evident that a great deal is being done in Germany for the insured rheumatic patient, and the fact that it has now been done for some years would appear to show that the approved societies find that financially it "pays." Representatives of these societies were interviewed, and although, as they say, actual statistics on such a point are unsatisfactory, they were agreed that this was so.

With regard to the position of medical men under this scheme there seems to be less unanimity; they are but poorly represented on all the insurance boards, and in the matter of clinics also they do not seem to have been given due consideration; in all cases the chief bone of contention is undoubtedly that of the increasing expenditure, which is laid by the societies entirely at the door of the doctors. From 1884 to 1914 sickness benefit payment had increased ninefold, according to the reports; what they do not appear to have noticed, however, is that during that same period the administrative expenses had increased fourteenfold (Finkenrath).

There is in Germany no category for "additional benefits," and spa and allied treatments accordingly come under the "general treatment" heading, as do all new or improved methods and drugs; it is reasonable, therefore, to suppose that an increase in the sick payments was inevitable when these methods were sanctioned. The efforts made by the societies to check this increase appear, however, to fall almost entirely upon the medical profession, to their eternal tribulation.

Whether or not the establishment of some similar scheme in England is possible, as has been recently suggested, it is outside the province of this article to discuss; but the advice proffered by a distinguished German medical man—to the effect that if a move be made, let it originate from the medical profession and not the societies—would appear salutary in view of the position of affairs in that country.

THE BERNE INTERNATIONAL CONFERENCE ON GOITRE.

THE International Conference on Goitre held in Berne on August 24th, 25th, and 26th drew about 120 experts from sixteen different countries. One of the objects of this conference was to promote, among experts representing every phase of the subject, formal and informal discussions on goitre, and the extent of the ground covered may be partly gauged from the fact that eight hours a day were spent at the formal meetings alone. The programme of the conference provided for an opening speech on the frequency of goitre in the different countries by the president, Dr. H. Carrière. Papers on the pathological anatomy of goitre were read by Dr. Aschoff of Freiburg and Professor Wegelin of Berne. In the place of Dr. Marine of New York, a paper was read by Dr. Graham of New York on this subject. He also dealt with the relationship in the United States between goitre, on the one hand, and cretinism and deaf-mutism, on the other. Professor Hûguenin of Berne gave an account of goitre among domestic animals in Switzerland, and Dr. Holst of Oslo drew attention to the remarkable frequency of this disease in the coastal districts of Norway. The pathological physiology of goitre was discussed by Professor de Quervain of Berne and Dr. Breitner of Vienna. Dr. Plummer of the United States was unfortunately prevented from attending this meeting. The etiology and epidemiology of endemic goitre were allotted to four introductory speakers, Professor Bérard of Lyons, Lieut.-Colonel Robert McCarrison of the Pasteur Institute, South India (whose paper was read by Sir James Berry), Professor Galli-Valerio of Lausanne, and Dr. Bircher of Aarau. In the discussion which followed attention was drawn to the influence on the provocation of goitre of such factors as the contamination of food and drinking water supplies.

The introductory speakers on the prophylaxis of endemic goitre were Professor Wagner von Jauregg of Vienna, Dr. Muggia de Sondrio of Italy, and Professor Silberschmidt of Zürich. The Swiss authorities and the foreign visitors drew attention to the value of the energetic prophylactic measures adopted in certain Swiss cantons, the provision of iodized salt for wholesale consumption in small quantities being particularly praised. Professor Nicolaysen and Dr. Lunde suggested that something could be done to reduce goitre by a diet of sea fish whose iodine content is exceptionally high. The benefits of iodine prophylaxis were, however, queried by some speakers.

The president's proposal that this conference should be followed by another on similar lines received general acclamation; the success of the conference may, indeed, be measured to a certain extent by the general expression of a desire to see it soon repeated. The work of its secretary, Dr. Stiner, was greatly appreciated. It should be added that the goitre exhibition organized in connexion with the conference proved a most attractive side-show. The following are some of the points made by Colonel McCarrison.

The Etiology and Epidemiology of Endemic Goitre.

Colonel McCarrison insisted that the constellation of causes which gives rise to goitre is not always the same, nor is the character of the disease identical in different parts of the world. Of the many theories professing to account for the origin of this disease, two have survived. The first is the iodine deficiency theory; the second is the infectious or toxic theory, which attributes goitre to some unknown pathogenic organism or to its products. Colonel McCarrison has come to believe that the truth lies in a judicious blend of both. In Himalayan India there is no evidence that the incidence of the disease is in inverse ratio to the iodine content of the soil. The water supply of two places some miles apart may be the same, yet goitre is present in one and not in the other. Drinking water containing 300 parts of iodine per 100 billion parts of water has not prevented the occurrence of the disease in endemic form in the presence of a high degree of bacteriological impurity of the water; the substitution of a bacteriologically pure for a bacteriologically impure water has caused the rapid and complete disappearance of

the disease from a place in which it had been endemic for seventy years, although the new water supply contained less iodine than the old. Iodine-containing salts appear, however, to have an influence in preventing this type of endemic goitre.

Colonel McCarrison recently obtained a deteriorated and bacteria laden rice from a goitrous locality in Burma which caused large hyperplastic goitre in 12.5 per cent. of birds fed exclusively upon it—a result suggesting that some positive goitre-producing agency, probably bacterial, was present in this rice. Its iodine content did not differ from that of other rices. In 1927 he found that, while a minority of pigeons developed large hyperplastic goitres when fed exclusively on an iodine-poor diet of American white flour, the majority did not. The occurrence of goitre in the minority could not, therefore, be attributed solely to iodine deficiency, but to the action of some positive agency peculiar to the affected birds. In iodine-poor localities goitre may develop spontaneously in well fed animals confined in dirty cages; only the most meticulous cleanliness prevents goitre in laboratory animals in such localities. It can also be prevented by increasing the consumption of iodine or cod-liver oil. Chlorine acts in a similar way, but with less certainty. Intestinal antiseptics—thymol, salol, B-naphthol, and *B. bulgaricus*—given to the subjects of goitre cure it in many cases, notably recent cases, without any change being made in habits of life, place of residence, or food.

After giving an account of his experimental production of goitre in goats and rats, and the experimental prevention of goitre in man, Colonel McCarrison concluded that the essential cause of the type of goitre with which he was dealing is a positive toxic agent derived from the gastro-intestinal tract. This agent may not in itself cause chronic hypertrophic goitre in the presence of a sufficiency of iodine, nor may an insufficiency of iodine cause the disease in the absence of gastro-intestinal infection. When both factors are present the conditions for the development of this type of goitre are at their optimum. Hence his recommendations for the prevention of this disease and its sequelae: (1) the perfecting of sanitation; (2) the provision of pure and protected water supplies; (3) efficient personal hygiene and drainage of the gastro-intestinal tract; and (4) the use of a well balanced food containing a sufficiency of iodine in a natural state.

THE VETERINARY CONGRESS.

THE annual congress of the National Veterinary Medical Association of Great Britain and Ireland has been held this week at Torquay, under the presidency of Mr. GEORGE WOOLDRIDGE, professor of medicine at the Royal Veterinary College, London. Among the numerous papers on general veterinary subjects two submitted to the Section of Veterinary State Medicine are of special interest to medical men.

Meat Inspection.

Lieut.-Colonel T. O. YOUNG, in discussing the "Veterinary surgeon in relation to meat inspection," stated that an ideal system of food inspection should include slaughter of all animals in public abattoirs, *ante-mortem* and *post-mortem* inspection by trained officers of all animals intended for human food, and inspection of all meat products and food factories. This system was in practice in many countries, including those from which this country obtains much of its food supplies, but no serious attempt had yet been made to adopt a similar system in England. Here meat inspection was only one of the numerous duties of a sanitary officer instead of being a special duty. Regulations existed, but their great weakness in practice was the lack of uniformity. One difficulty connected with a satisfactory system of inspection was the number of private slaughterhouses existing in England (about 20,000); this made regular and thorough inspection impossible. The position was different in Scotland, where 90 per cent. of the home-produced meat was prepared in public abattoirs. The English Departmental Committee, which inspired the Public Health (Meat) Regulations of 1924, recognized the necessity of reducing the number of slaughterhouses. Both it and the Scottish Committee also considered the subject of the qualification of meat inspectors. The latter decided that only medical or veterinary officers should be in charge of meat inspection, with lay assistants, where necessary, to act as "detention officers." The English Committee was less definite, and admitted the employment of non-professional officers, owing to the prohibitive cost of employing an "ideal staff." In England (but not in Scotland) veterinary officers have no official power to seize unsound food; the statutory right at present rests in the medical officer of health, the sanitary inspector, or inspector of nuisances. This was an extraordinary state of affairs, and should be remedied. Dr. Leighton regarded food inspection as being supervised by the medical officer of health, who, mainly occupied in administration and matters of policy, would act only in the nature of a consultant; the inspection was carried out by the veterinary surgeon, who would do the actual inspection of meat and milk.

Lieut.-Colonel Young said that no satisfactory system could be evolved until in every city and urban district veterinary officers were appointed in the public health departments. These duties would include: (1) inspection of all diseases under the Diseases of Animals Acts; (2) care of all horses owned by the local authority; (3) inspection of cows and cowsheds under the Dairies and Tuberculosis Orders; and (4) inspection of all animals slaughtered for food. They would probably need assistant veterinary officers or thoroughly trained assistant lay inspectors, or both.

Diseases of the Cow in Relation to Milk Legislation.

Mr. BRENNAN DE VINE, in opening a discussion on this subject, said that the cow filled a very important place in public health legislation, being attacked by many specific diseases, not a few of which were common to the cow and man. The most important and serious bovine disease in Britain was tuberculosis. The prevention of the infection of man was to a certain extent provided for in the Milk and Dairies Act, which prohibited the sale of milk from a cow affected with tuberculosis of the udder. Cows not in milk but affected with tuberculosis of the udder were dealt with under the Tuberculosis Order; but as this only applied to advanced cases, no great decrease in the number of diseased animals could be expected. In any septic condition of the uterus discharges might be transferred to the milk and any diseased condition of the udder or teats might render the milk harmful. In streptococcal mastitis the milk might cause sore throat in man, and in actinomycosis, a not very common condition in the udder, the infection might be carried to man by the milk. Although there were very few cases on record of the conveyance of anthrax infection to man by milk, the use of milk from infected animals should be prohibited. Foot-and-mouth disease was easily conveyed through milk, although in affected animals the yield was small.

The Application of Electrotherapy to Domesticated Animals.

Lieut.-Colonel MIDDLETON PERRY said that high-frequency treatment applied for from five to seven minutes daily had given most gratifying results in cases of paralysis from various causes, and had a wonderfully bracing effect on the whole system. It was a good stimulant to the skin and the growth of hair, and many cases of rheumatism were amenable to it. Fulguration had given good results in treating the small unpedunculated fibrous growths so common on the skin of many dogs. Ionic medication was useful so far as it could be applied in veterinary medicine for conditions similar to those treated in this way in man. Ultra-violet radiation gave excellent results in rickets, especially in the heavy breeds of dogs. Its effects were increased by the exhibition of cod-liver oil. Good results followed this treatment in eczema, and indolent wounds and ulcers, often unresponsive to other forms of treatment, readily yielded to this. He concluded by discussing the value of *x* rays as a diagnostic agent—especially before operations—in dogs and cats.

Other papers dealt with diseases of the udder and teats, other than mastitis; the clinical aspects of mange and eczema in the dog; lightning and electric shock in animals; and intestinal parasitism.

British Medical Journal.

SATURDAY, SEPTEMBER 17TH, 1927.

THE PUBLIC HEALTH: A STOCK-TAKING.

MEDICAL practice, that hurly-burly of problems and emergencies, affords but little opportunity for the "quiet calm deliberation" which, as W. S. Gilbert has told us, "disentangles every knot." Scant time is available for a survey of positions which have been won in the campaign against disease, or a critical study of the bewildering profusion of new methods of medical treatment. In these circumstances Sir George Newman's annual report on the state of the public health,[1] of which our concluding notice appears this week at page 499, is most welcome. We commend it in particular to the busy practitioner, who can hardly fail to draw from its pages both encouragement and practical help in his own work. The summary with which the report ends can be read in a very short time, and yet it gives a remarkably comprehensive sketch of the principles underlying the maintenance and restoration to health, both individual and collective.

"The function of the sanitary reformer is to reduce every reducible known cause of disease to its least possible degree of destructiveness." So wrote John Simon nearly seventy years ago in one of his masterly papers on the sanitary state of the people of England. The condition then was deplorable, and the inertness of public authorities a disgrace. Simon saw clearly enough that reform would be a long and hard business, uphill all the way. "It is indeed only by very gradual increase," he said, "that legislation and government can succeed in giving to human life the same security against the infliction of preventable disease as against the infliction of wilful violence; and millions may have died before this public carefulness for individual safety can have become co-extensive with even the present certainties of preventive medicine. But growing knowledge will bear its fruit." Growing knowledge has indeed borne fruit in this country since 1858, and a national sanitary conscience has grown up, so that it is possible for Simon's lineal successor, the Chief Medical Officer of the Ministry of Health, to write in 1927: "I suppose it is correct to say that never before in the history of this country has so much been attempted by the State on behalf of the health of the people as now. . . . The science and art of Preventive Medicine is extending in almost all directions; knowledge of it is becoming more applicable and effective; and public opinion is supporting the cultivation of health and fitness in the individual. . . . These changes indicate an immense awakening and a wider use of the improved environment and health facilities which the State has provided. Much disease and impairment remain, but evidence and experience suggest that we are on the high road to their amelioration."

The attainment of this happier position is admittedly due to the extension of preventive and curative medicine, and to their better co-ordination; yet no one will deny that much remains to be done. A wider outlook is essential, both on the part of the State and municipal official, who must co-operate freely with all who labour in the interests of the health of the community, and also of the general practitioner, who is being increasingly called upon to recognize that his duties embrace the work of communal as well as of individual medicine. Each appearance of the Annual Report of the Chief Medical Officer enables the working practitioner to take stock of the progress of the whole health movement; by using this recurring opportunity his hands will be strengthened, and he will be armed against those doubts and attacks which he inevitably encounters from time to time. For instance, the arguments and assertions of those who would deny to the community the benefit of vaccination against small-pox, without offering anything in its place, are effectively countered in the two pages devoted to a summary of the reasons for a belief in the value of this practice. Again, the shallow criticism too often directed against medical scientists —"Who shall show us any good?"—receives in the report a convincing answer. The extent and nature of the benefit of national health insurance to the community is clearly brought out. Many other instances of important subjects, effectively yet briefly treated, will be found.

This report, then, deserves close study, both by those who welcome stimulus for thought and by the many who need concentrated practical information. The yoking of statistical science to the every-day problems of life is no mean achievement, and when, as here, a judicial attitude is preserved, and the results are set out with philosophical deliberation, the conclusions are worthy of very careful consideration. The far-reaching influence of the British Broadcasting Corporation was used one evening lately to advertise to laymen the practical value of this balance sheet of human health; it is obvious, therefore, that it must receive the special attention of the medical profession, whose members may otherwise find themselves in the awkward position of being less well informed, on some points of detail or even of principle, than those whom it is their duty to instruct in the conditions of health. Finally, the considered optimism which characterizes the report as a whole may well bring encouragement to the great body of general medical practitioners, many of whom, in the stress of their daily round, have little time to reflect on the large share they themselves take in promoting the happiness and well-being of their fellow men.

[1] *On the State of the Public Health.* Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1926. H.M. Stationery Office. (Med. 8vo, pp. 281. 3s. net.)

BIOMETRICAL INVESTIGATION OF DISEASE.

A NOTEWORTHY development at the Johns Hopkins Hospital, Baltimore, is the utilization of its elaborate clinical notes by the application of modern statistical methods under the inspiration of Professor Raymond Pearl, who is head of the department of biometry and vital statistics in the School of Hygiene and Public Health, and of biology in the Medical School of the Johns Hopkins University. In the past the pioneers of biometrical methods were primarily biologists, and between biology and medicine there was a gulf which made sympathy and correlation difficult. Now the sciences of physiology, anthropology, and biometry are being applied to medicine with, it may be anticipated, great advantage to a profession which is both an art and a science. Statistical methods demand a mathematical knowledge rare among medical men, except those whose training or temperament has been on rather exceptional lines. Professor Karl Pearson, who was third wrangler at Cambridge in 1879, is the

founder of the British school, but it is perhaps remarkable that among his pupils few have come from that university.

The twenty-first volume of the *Johns Hopkins Hospital Reports*[1] contains two fasciculi devoted to the elucidation of morbid conditions by biostatistical methods. Four years ago reference was made in these columns (1923, i, 1104) to the first of a series of biometrical studies in pathology, dealing with the quantitative relations of certain viscera in tuberculosis, by Raymond Pearl and Agnes Latimer Bacon. Examination of a group of cases in which the main lesions were those of tuberculosis led to the conclusion that the heart was relatively small and the spleen large—a different conclusion from that drawn from the study of patients with tuberculosis which was inactive and accompanied by other morbid conditions. These results led to an investigation of the absolute weight of the heart and spleen in tuberculous persons. Utilizing the same material—1,341 necropsies showing tuberculosis of some sort, 825 being active and 516 inactive—the authors undertook to elaborate data and to correlate the absolute weights of the heart and spleen with age. These age-organ weight tables at once showed, as might be expected, (1) that the weights of the organs changed with advancing age, but (2) that this regressive change was not linear, indeed far from it, especially in the case of the spleen. The absolute weight of the heart was notably larger at each age from birth to an age somewhere between 35 and 55, and then steadily but more gradually got less; this curvilinear form of the regression line is essentially the same at the same age, in the two sexes, and in whites and negroes, whether or not the heart shows pathological lesions. The heart is smaller when tuberculosis alone kills than when other pathological lesions are partly responsible for death. In like manner the regression of the weight of the spleen is progressively greater up to the decade centring at 35 years, and then becomes less; the absolute weight is greater in the negro race than in whites, and there is a tendency for the spleen, especially when it does not show any morbid change, to be heavier when tuberculosis is the only significant pathological lesion; but, contrary to the suggestion made in the earlier paper, comparison with the tables of the weight of the normal spleen shows no evidence that the spleen of patients with tuberculosis is heavier than that of normal non-tuberculous persons.

The other paper, which is by Miss Mary Gover, is a statistical study by modern methods of the etiology of benign hypertrophy of the prostate, and is based on the "punch cards," each of which contains 156 items, of 997 cases examined microscopically at the Johns Hopkins Hospital. The conclusions drawn are interesting, but largely of a negative character. There is not sufficient evidence to warrant a definite decision as to hereditary influence. Patients who had had gonorrhoea—33 per cent.—formed a group having an early age of onset and operation, possibly due to gonococcic complications, for the prostate was smaller than in the other cases, so that it may be said that gonorrhoea does not cause hypertrophy. Single men appeared to be not so liable as married men, but when they did suffer the prostate was as large as in the married; no relation could be shown to exist between the patient's reproductive activity and the size of the prostate, nor did alcoholism seem to exert any influence in this direction; men following sedentary occupations were not more prone to prostatic hypertrophy than those engaged in active physical work. There was no correlation between the systolic blood pressure on admission and the weight of the prostate. It appears that the increasing growth of the prostate with age is not continuous; it occurs mainly between 45 and 75 years of age, and both before and after this period is slower. The average age of onset of symptoms was 60.2, and of operation 66.7 years.

[1] *The Johns Hopkins Hospital Reports*, Vol. XXI. Fasciculus IV: A Statistical Study of the Etiology of Benign Hypertrophy of the Prostate Gland. By Mary Gover. Fasciculus V: Biometrical Studies in Pathology—III, The Absolute Weight of the Heart and Spleen in Tuberculous Persons. By Raymond Pearl and Agnes Latimer Bacon. Baltimore: The Johns Hopkins Press. 1923 and 1924.

THE WHITE MAN IN THE TROPICS.

For long it was taken for granted that the tropics were necessarily unhealthy for white men, and the prevalent sickness and high mortality in hot countries were ascribed to telluric influences inseparable from the climatic conditions. As knowledge of the etiology of tropical diseases increased and practical methods of prevention developed, there followed a swing of the pendulum, until nowadays some hold that the climatic conditions of hot places are negligible, and that exogenous disease and incorrect diet are the only obstacles to the permanent settlement of white races in the tropics. The question is obviously important, and fresh interest has been aroused in it by the advocacy of a "white Australia." Divergent views have been expressed with considerable vigour, but without any convincing evidence based on scientific inquiry. Sundstroem, working in Townsville, North Queensland, has approached the problem by studying the various changes which occur in vital processes when men accustomed to temperate climates are transferred for shorter or longer periods to the tropics. Townsville, described as the largest tropical community in the world with a pure white population, offers excellent opportunities for such inquiry, and the likelihood of physiological modifications being confused with changes due to disease is less there than in most other tropical towns, for locally acquired malaria and other parasitic affections are uncommon. Various examinations, including those of the blood sugar and phosphorus contents, protein metabolism, water regulation, and comparisons of the results with the standards in temperate climates, seem to indicate that climatic factors do exert a definite influence calling for human adaptation, which may or may not be adequate. This is about as far as Sundstroem is willing to push his conclusions, though he regards the adaptation required to meet the altered cooling power of the environment as making demands upon the whole bodily economy, the necessary alterations extending beyond the ordinary heat-regulating mechanism. Some Australian writers have laid stress upon the fact that local insurance companies accept proposals from the residents of North Queensland at the same rates as apply to temperate regions. When the point was raised at a recent meeting of the Institute of Actuaries in London, no definite opinion was expressed regarding tropical Australia, but the general view seemed to be that on a life-table basis an extra premium was necessary in any part of the tropics. Insurance tariffs, however, represent the business policies of the companies concerned, and into this question there will enter other factors besides the mathematical expectation of life. Professor H. Priestley, to whose investigations at the Institute of Tropical Diseases at Townsville we have previously referred (JOURNAL, 1922, vol. ii, p. 233), when addressing the Pan-Pacific Congress in Australia in 1923 expressed the opinion that physical health need not suffer, but he made reservations as to the effect of hot climates upon mental health. The diversity of views upon this aspect of the subject was illustrated last year in the correspondence which followed the publication of a letter by the Bishop of Singapore upon

mental irritability and breakdown in the tropics (JOURNAL, 1926, vol. i, p. 503). More work upon the lines of that done by Sundstroem is required, but very much fuller data are necessary before such comparisons as he makes can safely be accepted. Meantime, in North Queensland a great experiment is in progress. Several generations may have to pass before conclusive results can be obtained, for the considerations involved are so numerous and so interwoven that the proof of this pudding may well be in the eating rather than in minute analysis of its ingredients.

STANDARDIZATION OF ULTRA-VIOLET LAMPS.

ATTEMPTS to measure and standardize ultra-violet radiation are being made continually, but most of the methods suggested, scientifically sound though they may be, appear too cumbrous for use in practice. In some of the latest work in this field, which has resulted in a chemical method of standardization,[1] it is admitted that some simpler procedure is necessary, and experiments are being continued from that point of view. The method employed in this instance depends upon the photochemical decomposition of oxalic acid in the presence of uranium acetate, which furnishes a measure of the strength of the emitted ultra-violet radiation. It has been used for the testing of carbon arc lamps employed for light treatment at the Birmingham City Sanatorium, and certain interesting comparisons have been made between lamps of different electrode characteristics. Lamps having carbons with a mineralized core were found, on a 30-minute test, to be 2.7 times as strong in ultra-violet action as lamps having two carbons of the ordinary kind, and on a 15-minute test to be 3.3 times as strong. When the upper positive electrode was a carbon with a mineralized core and the lower negative electrode an ordinary carbon, the results on a 30-minute test were 2.9 times, and on a 15-minute test 2.6 times, as strong as with ordinary carbons. With the carbon-tungsten arc a silica lens is interposed for local treatment, and with this lens in position the ultra-violet radiation at 12 in. from the arc was found to be eight times as strong as the radiation at 28 in. (the usual distance between the patient's thorax and the arc) from ordinary carbons. Without this lens the carbon-tungsten arc had about one-third of the strength of ordinary carbons calculated on a 15-minute test. The experimenters (Mr. J. E. Moss and Mr. A. W. Knapp) found that the mineralized carbons had a tendency to splutter and obviously to vary in emission from minute to minute; the carbon-tungsten arc also spluttered slightly and required occasional adjustment of its electrodes, but ordinary carbons were much more constant. The quantity of ultra-violet radiation reaching a patient depends upon the source of the radiation, the distance and position of the patient in relation to the source, and any interposed material such as lenses or screens. These investigations have established that the intensity of the radiation at any given point as shown by the oxalic acid decomposition test is inversely proportional to the square of the distance of that point from the source of the rays. If, therefore, two patients are exposed to the radiation from the same arc at the distance of one yard and of two yards respectively the former will receive four times as strong a dose as the latter. When the range from the part treated to the naked arc is 18 in. or less, small variations in distance should be avoided or careful allowance should be made for them. If only one carbon arc is used for the treatment of a number of patients simultaneously, the patients should be placed around the circumference of a circle drawn on the floor, the centre of the circle being vertically beneath the arc; but when, as often happens, two arc lamps are used, the curve joining the points of equal exposure approximates closely to an ellipse. The authors examined one arrangement whereby one of two patients who were supposed to be receiving the same treatment from two carbon arcs was actually receiving one-third more radiation than the other. Some tests have also been made by oxalic acid decomposition on the difference between sunlight and mercury vapour lamps. The radiation at 8 in. from a mercury vapour lamp which had been in use for 100 hours proved to be one and one-third times as strong in ultra-violet as brilliant July sunshine at Bournville; at 25 in. the light from the lamp was only about one-eighth of the strength in this respect of bright sunshine. The trouble in all this work seems to be that it is only possible to argue loosely from lamp to lamp or from the output of a particular lamp at one stage to its output at another.

[1] The Examination of Carbon Arc Lamps. By J. Ewart Moss, A.I.C., and Arthur W. Knapp, F.I.C. *British Journal of Actinotherapy*, May, 1927.

CHRONIC INTESTINAL AUTO-INFECTION.

CHRONIC intestinal auto-infection is defined by Dr. P. Desgeorges[1] of Vichy, who has written much on this debatable subject, as the intermittent, transient, or more or less constant passage of comparatively slightly virulent bacteria from the bowel into the circulation, and, though slowly producing widespread changes, very different in its results from those of the cases of undoubted *B. coli* septicaemia. This difference must obviously depend on the size of the dose and the resistance of the body. The author's experimental injection into the veins of a rabbit of one million colon bacilli did not give rise to bacteriaemia, whereas another rabbit injected with fifty millions became acutely ill and gave a positive blood culture. In chronic intestinal auto-infection the number of bacteria in the blood at any one time is so small that blood cultures are sterile, although, as Adami and his co-workers showed in 1899, visceral invasion proves that bacteriaemia occurs. The question must naturally arise in the reader's mind how to distinguish in practice between the more familiar chronic intestinal intoxication, in which the absorption of poisons only is predicated, and the graver chronic intestinal auto-infection. The criterion appears to be provided by the presence of bacteria in the urine, and Dr. Desgeorges protests against the view current in France that all women have coli-bacilluria, and that therefore it is unimportant; in all positive cases he has been able to correlate with the presence of bacteriuria symptoms which wax, wane, and diminish in proportion to its degree. Among 85 cases he found the colon bacillus in 69, the enterococcus alone in 10, and in combination with the colon bacillus in 5; in one instance he found both the *B. coli* and *B. paratyphosus*. Often, no doubt, chronic intestinal intoxication and infection are both present, and Dr. Desgeorges admits that Sir Arbuthnot Lane and he are very often applying to the same condition different names, but he maintains that the conditions are different. The region of the caecum and ascending colon is regarded as a special site of entrance of the bacteria which reach the circulatory system, the kidneys, and the body generally, not so much by way of the portal vein, as has often been assumed, as by the lymphatics and the thoracic duct. The passage of bacteria to the liver, which is responsible for inflammation of the biliary tract, hypercholesterolaemia and gall stones, is considered to occur through the hepatic artery. Chronic intestinal auto-infection Dr. Desgeorges believes to be three or four times commoner in females than in men, on account of constipation, visceroptosis, the sedentary life, and pregnancy. It is hereditary and familial, but rarely conjugal. Besides stasis in the caecum and ascending colon, chronic appendicitis, colitis, bites of oxyuris and inflammation impairing the resistance of the colic mucosa,

[1] Desgeorges, P., *Rev. de méd.*, Paris, 1927, xliv, 163-188.

are etiologically important. The kidney and the liver which excrete the bacteria are specially prone to suffer from chronic inflammations and disorders; oxaluria is common, and a form of lumbago, peculiar in being worse in the recumbent position and so at night, occurs in the absence of any definite renal lesion. The general symptoms are, like those ascribed to intestinal stasis, protean, especially "the entero-nervous syndrome which includes the majority of so-called nervous disorders of an indefinite character"; cancer, however, is not mentioned. Treatment is not so easy as diagnosis; surgery has its place when adhesions or chronic appendicitis are responsible; dieting and treatment at a health resort are important, but vaccine therapy is usually disappointing.

MEDICINE AND THE FRUIT INDUSTRY.

THE activities of modern industrial enterprise are truly colossal, especially in America. The United Fruit Company, of Boston, Massachusetts, has issued recently the fifteenth annual report of its medical department, and the general manager of the department, Dr. W. E. Deeks, states that about 5,000 copies of the report are distributed (largely by request) to individuals interested in tropical problems, to scientific institutions, and to libraries. The ramifications of the United Fruit Company are shown on a map at the beginning of the volume, wherein are depicted the plantation districts in Central and South America, in Cuba, and in Jamaica, together with the numerous routes of the company's steamships to the chief eastern ports of the United States and the routes taken by the Elder Fyffe line to England and Rotterdam. In six tropical divisions and for two railroads the company maintains fully equipped hospitals. Nearly fifty medical officers are attached to these divisions, and the services of fifteen consultants and others are retained in such a way that their names appear among the personnel of the medical department. From some seventy pages of statistics at the end of the report it appears that the medical department of the United Fruit Company undertakes responsibility for 223,000 people; that during 1926, 29,000 were treated in hospital; 150,000 treatments were given in hospital dispensaries; and that 2,000 operations were performed with general anaesthesia and 40,000 with local or none. The bulk of the volume, however, is filled with original articles and reports by members of the medical personnel. Among these is one by Dr. Aldo Castellani, professor of tropical medicine at the Tulane University, New Orleans, on the classification of bacterial dysenteries and of dysentery bacilli. The articles are illustrated with pictures of diseased conditions, of sundry parasites, and with *x*-ray photographs; and at the beginning of the report photographs of the company's hospitals are reproduced. So varied are the duties for which the medical officers are called upon that the volume concludes with an article on general instructions for embalming. The report is a fascinating picture of the varied interest attaching to the medical side of a great commercial undertaking.

THE N.S.P.C.C.

THE annual report of the National Society for the Prevention of Cruelty to Children for 1926-27 is entitled *Progress*. The name is used not so much for the purpose of showing increase in such activities as prosecution, but rather to indicate the measure of success attained in improving the status of children. Thus the number of children requiring help is falling; the gravity of offences against children is not increasing, and the prosecutions show a marked decrease. The need for removal of children from their parents' care—or lack of care—is growing less, and drink is no longer the principal cause of cruelty. On the other hand, there has been development in the medical branch, with its two ambulances in London for conveying children to hospitals; the number of parents seeking advice from the society is increasing; and a special inspector looks after the interests of children on canal boats. The society hopes that in time Parliament will pass an Act excluding all children from these boats. One direction in which the medical branch, under Dr. L. D. Saunders, is extending its activities is in persuading or helping parents to submit their children to operation or other treatment which has been advised by school medical officers or hospital surgeons. The inspectors frequently convey the child to and from the hospital in the society's ambulances. With the retirement from the directorate of Sir Robert Parr, who succeeded the Rev. Benjamin Waugh in 1905, a second chapter in the history of the society may be said to have closed. The executive committee looks forward to increasing usefulness in the future.

THE LEPERS OF MAKOGAI.

Dr. A. MONTAGUE, chief medical officer of Fiji, has sent us a small book on the above subject, written by Dr. F. Hall, who was medical superintendent of the leper hospital there from 1911 to 1920. Makogai and Makodraga are two islands lying some eighteen miles north-east of Levuka, the old capital of Fiji. They used to be a coco-nut plantation, but when the Government of Fiji made the segregation of lepers compulsory, they were purchased and converted into a leper colony. Here are collected all the lepers of Fiji, a country scattered over an archipelago three hundred miles in extent; it promises to become the leper station of the Southern Pacific, for New Zealand now sends its lepers there, as do Samoa, Niue Island, Tonga, and the Cook Islands; the Gilbert and Ellice groups will probably do so in the near future. Makogai is two and a half miles long; it is a rocky cone, rising nearly 200 feet above the sea, with four distinct and many smaller peaks running down to the sea in ridges. From the summit the spectator looks down on a series of sandy bays fringed with palms, the sea of every shade of blue and green, marked with lines of white surf where the waves break on coral reefs, and beyond, the deeper shade of the ocean, studded with islands as far as the eye can reach. Near by is the rocky islet of Makodraga, giving shelter and an excellent anchorage to the bay of Delice, where is the main leper hospital. Scattered over the island are the leper villages, five in number, each nationality having its own village, with its native headman, who is paid a small sum by the Government and is responsible for cleanliness and good order. Work is expected from, and is beneficial to, the lepers if they are capable of it, and they are given the use of land and implements of cultivation, their surplus crops being purchased by the Government if they so desire. They have also their own store, run on a co-operative basis, from which they can purchase almost everything they desire. They can, besides, earn money in connexion with the erection of new buildings and general public work at Delice a bank has been established, and is largely used for the deposit of savings. Sports and amusements are encouraged, and there is abundant opportunity for fishing, boating, model yacht racing, dancing, and so forth. Each denomination has its own church, well built and attractively furnished; and a large building for a school has recently been completed. With regard to the prospects of cure, Dr. Hall states that if patients would only come early enough—at the first sign of an anaesthetic spot or macule or nodule—they could be cured. The hospital statistics are indeed very encouraging; of the 954 patients admitted since its opening in 1911, 444 have been discharged (100 on parole as cured, 19 unconditionally as cured, 325 repatriated); it is a very noteworthy fact that of the patients so discharged, only 6 have been readmitted owing

to renewed activity of the disease. The hospital consists of a number of detached buildings pleasantly situated in a palm grove, with a staff comprising a medical superintendent, a lay superintendent, twelve European sisters, an overseer, and a launch driver. There is a well equipped laboratory, with every facility for bacteriological, microscopical, and photographic research. From Dr. Hall's description and the photographs of the country which illustrate it, it is evident that they are in no way behind us in Fiji, and have some attractions of which we cannot boast.

THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH.

As the Rockefeller Foundation has so many activities, it is useful for the sake of reference and information to have the recently issued account of the organization of the Rockefeller Institute for Medical Research,[1] founded in 1901, and its three departments—the general laboratories, the adjacent hospital, and that of animal pathology. The Department of the General Laboratories, of which, as well as of the Institute as a whole, Dr. Simon Flexner is director, has five divisions: that of Pathology and Bacteriology, with a number of subdivisions conducted by workers with such well known names as Drs. Noguchi, Peyton Rous, Olitsky, Salvin, and Gates; the Division of Chemistry, under the guidance of Dr. P. A. T. Levene; that of Experimental Surgery, under Dr. Alexis Carrel; that of General Physiology, conducted by Dr. W. J. V. Osterhout; and that of Biophysics, by Dr. J. B. Murphy. The Rockefeller Hospital, which has been under the direction of Dr. Rufus Cole since it was opened in 1910, investigates certain forms of disease, and the patients admitted are all suffering from the conditions under consideration at the time; the problems now being studied are acute respiratory disease, acute rheumatism, cardiac disease, nephritis and blood chemistry, respiration, and chicken-pox. The Department of Animal Pathology, opened in 1917 and presided over by Dr. Theobald Smith, is on the shore of Carnegie Lake, opposite Princeton, New Jersey, and stands in a tract of 525 acres, the property of the Institute. All members of the scientific staff are paid, are required to be whole-time, to have preliminary training such as would be represented by an M.D. or a Ph.D. degree, and to possess a knowledge of research. The Institute does not confine its investigations to problems having an immediate application to human pathology, but considers that it can best serve medical science by devoting a great deal of attention to fundamental biological, physical, and chemical problems. Further, though the greater part of the research work is carried out in the laboratories of New York and Princeton, expeditions for the solution of problems, such as that of yellow fever in South America, led by Dr. Noguchi, are undertaken from time to time.

CATS AND MICE, AND BEEF.

ONE of the major problems of stock owners in this and other countries is the control of parasitic infections, and one of the most important groups of these diseases is that family which infests the lungs. In most cases the life-history is unknown, but a recent article in the *Journal of Helminthology*[2] on an analogous condition in domestic cats may assist in the solution of this problem. Cats in various parts of Britain suffer from a parasitic pneumonia caused by a minute species of roundworm. This worm lives in the parenchymatous tissue of the lungs, and there lays innumerable eggs, which hatch *in situ*. The larvae which emerge are swallowed, and pass to the exterior in the droppings; there they die, unless swallowed by mice which feed on this material. Once swallowed, they migrate to the connective tissue and, encysting, wait until the mouse is eaten by the cat, when the cycle is completed. A somewhat similar state of affairs is found in the case of the common cat tapeworm, and laboratory workers throughout the world are familiar with the elongated cyst of that form in the mouse's liver. Biological control obviously depends on preventing the cat from eating mice—for once in a way rodents and hygiene conspire together to bell the cat. But if cats are not permitted to catch mice their chief function in life, at least in many humble homes, has disappeared. If they carry out their duties they suffer from a severe and often fatal pneumonia or from tapeworms. What, then, is to be done with our cats? Sir Arthur Keith's recent masterly survey, at the Leeds meeting of the British Association, of modern conceptions of evolution recalls Charles Darwin's story of cats and clover. It had been found that red clover will seed only when the plants are cross-fertilized by visits from bumble-bees. (The clover crops in New Zealand were failures until bumble-bees were introduced to fertilize them.) The nests of the bees, however, are raided by field voles, which greedily feed on the larvae they find there. Accordingly, the more field voles the fewer the bees, and consequently the poorer the next crop of red clover. But near villages cats kill (but do not eat) field voles; and so it follows that the greater the number of cats the fewer the voles, the more bumble-bees, the better the clover crop, the richer the pasture, and the greater the production of beef. Our dinners, then, depend to some extent on the number of cats present. This might suggest an alternative occupation for an animal which obviously is suffering from two distinct industrial diseases; and perhaps in future its most important function in a man-controlled world should not be to assist in the accumulation of wealth of Lord Mayors of London Town (that could be relegated in part to the more prosaic mousetrap), but in helping to maintain the traditional quality of the roast beef of England.

[1] *The Rockefeller Institute for Medical Research: Organization and Equipment.* New York: The Rockefeller Institute for Medical Research. 1927. (Pamphlet 6¾ × 10, pp. 24; 2 plates.)
[2] T. W. M. Cameron: *Journal of Helminthology*, 1927, vol. v, pp. 55-66.

ROYAL SOCIETY OF MEDICINE: SPECIAL DISCUSSIONS.

AT a conference of the presidents and presidents-elect of the various sections of the Royal Society of Medicine, held three months ago under the chairmanship of the President, Sir James Berry, it was decided to continue the holding of special discussions during the forthcoming session. The following subjects were agreed upon, and are now announced in the calendar of the society for 1927-28; the dates will be settled later and notified on the diary card. Two discussions will be held by the society as a whole—one on diet as a factor in the causation of disease, and the other on cleansing the colon. Twelve joint discussions will be held by the sections immediately concerned; their subjects are as follows: (1) chronic appendicitis in children; (2) treatment of pyuria in children; (3) the influence of naso-oral sepsis on the lungs and gastro-intestinal tract; (4) neuroses in the tropics; (5) cutaneous mycoses in the tropics; (6) ocular complications of encephalitis lethargica; (7) surgery of the heart and pericardium; (8) new methods of treatment of pernicious anaemia; (9) treatment of varicose ulcers by intravenous injection; (10) effects of middle-ear disease on efficiency in civil and military life; (11) the pulpless tooth; (12) radiological pitfalls.

THE fifth David Lloyd Roberts Lecture has been arranged by the Medical Society of London for Wednesday, November 16th, at 5 o'clock. It will be delivered by the Right Hon. Lord Hewart, Lord Chief Justice of England, who has chosen as his subject "Criminal law and insanity."

Nova et Vetera.

A SURGEON ENSLAVED.

IN the year 1689 John Taylor, "at the sign of the ship in St. Paul's Churchyard," offered for sale "A Relation of the great sufferings and strange adventures of Henry Pitman, Chirurgion to the late Duke of Monmouth," etc. (reprinted in Arber's *English Garner*, vol. vii, 1883).

In this little book, of which there is a copy in the British Museum, Pitman tells us that when on a visit to relations in Somerset he heard of Monmouth's landing, and out of curiosity he and his brother and some friends rode to Taunton to see the Duke and his army, and found, when they wished to return, that their road was blocked by the Government forces. Pitman accordingly yielded to the desires of his friends and acquaintances that he should attend to the sick and wounded in the rebel forces.

There does not appear any justification for his styling himself Chirurgion to the Duke, nor does he tell us that he so much as had speech with him. He says that he was never in arms himself, but attended to the wounded and the sick at Sedgemoor on the fatal sixth of July, 1685, after which he fled homewards, but was taken prisoner and committed to Ilchester Gaol, and afterwords, with his brother and many others, was tried at Wells Assizes, when they were found guilty and sentenced to be hanged, drawn, and quartered. This sentence was soon afterwards commuted to transportation to the Caribbee Islands.

Long before Botany Bay was discovered it was the evil custom of the English Government to sell its convicts into what was practically slavery in the plantations of the southern colonies of the North American continent and of the West Indies. The French also sent convicts and prostitutes to the Mississippi as early as the seventeenth century, as we may read in Prevost's *Manon Lescaut*. Not only were criminals so transported, but a large proportion of the Scottish prisoners taken at Dunbar were similarly treated; and occasionally, at least, persons whose presence in England was inconvenient were kidnapped and indentured as servants to the planters. Like all slaves, the hardness or comparative mildness of their lot depended largely upon the dispositions of their masters. Defoe probably had good grounds for his description, slight as it is, of the experiences of Moll Flanders in Virginia. He also had taken part in the rising under the Duke of Monmouth, but, more fortunate than the subject of this article, escaped the tender mercies of Jeffreys and of Kirke.

In those days it was not the practice of the Government to assume the care of the transported convicts either on the voyage or after arrival. The responsibility was transferred to purveyors of forced labour and to the planter in the colonies, the Government being thus saved the trouble, and the revenue possibly benefiting by the sums paid by the slave dealers—for so in fact they were—as purchase money. Pitman tells us that, in accordance with this practice,

> "my brother and I with nearly a hundred more were given to Jeremiah Nepho; and sold by him to George Penne, a needy Papist, that wanted money to pay for our transportation, and therefore was very importunate with my relations to purchase mine and my brother's freedom."

It seems that Pitman's relations were people of substance, for they paid Penne £60 on the condition that he should set the brothers free on their arrival in Barbados, to which island they were travelling.

Penne was bound with his brothers in a bond to pay £120 if this and other conditions were not fulfilled. Unfortunately for the prisoners, the Governor and the Assembly of Barbados, in an access of loyalty or panic, passed an Act under which it became impossible for Penne to carry out his undertaking. By this savage law the period of service of all the Sedgemoor convicts was fixed at ten years without redemption. It was to be enforced under severe penalties. Attempts at escape were to be punished by thirty-nine lashes on the bare body, the pillory, and branding on the forehead with F.T.—meaning "Fugitive Traitor."

The voyage from Weymouth to Barbados occupied five weeks; it was very sickly, and nine of the passengers died. On arrival in the colony the brothers were sold to one Robert Bishop. We are not told what kind of work they were put to, but Henry evidently practised his profession, although his master took all the fees. He would not, however, give them clothes, and their diet was "very mean"—"5 lb. of salt Irish beef, or salt fish a week, for each man, and Indian or Guinea Corn ground on a stone, and made into dumplings instead of bread." This diet, which was not very suitable for the tropics, brought Pitman, so he says, "to a violent flux." His requests for an improvement and his protests against his treatment resulted in his being severely caned and put in the stocks in the full heat of the sun for twelve hours. It should be remembered that Barbados lies only about thirteen degrees north of the equator. Bishop got into money difficulties, and could not complete payment for the slaves, so that the brothers were returned into the merchant's hands as goods unsold. Soon after this, however, Henry's brother died and Henry determined to make an attempt to escape from the island.

It seems that he had a friend in Barbados to whom his relations in England sent money for his benefit, and thus he was enabled to buy a boat and the necessary stores and to bribe assistants. The list of stores is interesting:

> "A hundredweight of bread, a convenient quantity of cheese, a cask of water, some few bottles of canary and Madeira wine and beer; these being for the support of nature; and then for use, a compass, quadrant, chart, half-hour glass, half-minute glass, log and line, large tarpaulin, a hatchet, hammer, saw and nails, some spare boards, a lantern and candles."

Thus the party of eight, six of whom were Sedgemoor prisoners, which started in an open boat at midnight of May 9th, 1687, was not badly provided. They were bound for the Dutch island of Curaçoa, for they durst not land on an English possession for fear of recapture. The distance in a straight line is nearly seven hundred statute miles, making the voyage a daring adventure, but there are many islands by the way at which the fugitives hoped to refill their water-cask and no doubt obtain food of some sort or another.

They stole out of the roadstead, presumably Bridgetown, at night, and despite a leaky vessel and bad weather and the impossibility of taking observations with the quadrant, going from island to island they reached the isle of Saltatudos a week after leaving Barbados. Pitman nowhere tells us how or where he acquired any knowledge of practical navigation. He attributes his failure to get observations of the sun to the movement of the boat and the nearness of the sun to the zenith. It was then May, and the latitude of Saltatudos is given by him as 11° 11′ N. Here they found a party of twenty-six privateers, who had somehow been left behind by their shipmates. These men tried to persuade Pitman and his companions to leave the island with them in canoes, or piraguas as they were called locally, and on their refusing the privateers burnt the boat, used the nails thus obtained to fasten top-sides or weather-boards on their canoes, and all but four sailed away, leaving the others marooned.

The island of Saltatudos, by which name it was known to the English, was so called on account of its natural salt-pans, which were visited by the Spaniards and others at intervals of many months in order to obtain salt. By the Spaniards it was known as Tortuga, from the number of turtles that were found on its shores, and this name it still keeps. It is some twelve miles long by three broad, and is situated about fifty miles from that part of the Spanish Main which is now known as Venezuela and about four hundred miles from Barbados. There are a number of places of the same name in the West Indies and Central America, the best known being another island lying to the north of Hayti. Pitman called his island "uninhabitable," but though it was then and still appears to be uninhabited, it proved to be quite habitable, for the turtles and numerous birds and fish provided abundant food, and there was a good supply of fresh water. The lack of farinaceous food

was felt, however, and the diet of turtles and their eggs brought on diarrhoea, which Pitman cured with

"an opiatic tincture which I had provided on another occasion. For before we came from Bardadoes, I thought of a way to deliver ourselves out of our enemies' hands, in case we should be taken, without shedding of blood. And it was thus. I dissolved a sufficient quantity of opium in a bottle of rich cordial water, which we carried with us in the boat intending to give it to those persons that should take us, which I supposed they would readily drink, and by that means would be overtaken with so profound a sleep that we should have opportunity sufficient to make our escape from them."

It was as well that this tincture was put to a less dangerous use. There were no trees on the island, but plenty of bushes, which provided fuel and some edible fruits. One plant, which he calls a "curatoe," provided a juice which scoured their clothes in place of soap; moreover, its leaves when fermented furnished a sweet juice "like the syrup of baked pears," from which they prepared "a most pleasant and spirituous liquor to drink. The innermost part of the body or stump we cut into slices, and ate it like bread." This admirable plant, which Arber suggests might have been an agave, reminds us of the natural products which the Swiss Family Robinson found ready to supply every want. A substitute for tobacco was found in a certain herb which he called wild sage; and crab's claws served for tobacco pipes. He does not complain of the heat, although the months of May, June, July, and August, during which he remained on the island, must have been hot enough in the absence of any effective shade. At the end of this time a privateer ship appeared and took on board the four men the canoe party had left behind and then inquired "Which was the Doctor?" When Pitman was pointed out they invited him to sail with them but refused to take his fellow-refugees from Barbados.

"When we came to the man-of-war, I was very honourably handed up the side, the trumpets in the meantime sounding, and very kindly received and welcomed aboard by the Captain and Doctor: who invited me aft into the Great Cabin where I was not only feasted with wine and choice provisions but had given me by the Doctor a pair of silk stockings, a pair of shoes and a great deal of linen cloth to make me shirts, etc."

If the buccaneers were so villainous as some have thought, their name is nevertheless, like that of Byron's Corsair, "linked with one virtue"—a due appreciation of the medical profession, as was noticed in an article on "Buccaneer Surgeons" in the JOURNAL of August 26th, 1922 (p. 397). The privateers took him to Providence in the Bahamas, where they burnt their ship and shared their booty, and after some stay Pitman sailed to New York, and thence, in a vessel bound for Amsterdam, he reached the Isle of Wight, and so returned home to find that his friends had procured his pardon. He seems to have set up as a vendor of nostrums, for at the end of the original work there is a page of advertisement of the "Quintessence or Powers of Scurvy grass, both plain and purging," price one shilling a bottle; of "Magisterium Anodinum" to cure pain, price one shilling a box; of "Spiritus Catholicus," a kind of panacea, and Pillulae Catharticae. "These medicines are all prepared and sold by Henry Pitman at the sign of the ship in St. Paul's Church Yard."

There we leave him. His name does not appear in the books of the Barbers or of the Apothecaries Company, and it seems probable that he was unqualified, for he nowhere claims to be a physician. He seems to have been a real person, for in the Calendar of Treasury Books, vol. viii, pt. I, we find, under date 1685, the following entry: "Co. Somerset Wells. Prisoners delivered for transportation to Jerom Nipho . . . Hen. Pitman," and among a number of other names we find that of William Puttman, which might well be a misspelling of his brother's name. The following entry in the Calendar of State Papers, Domestic, William and Mary 2, 1690-91, p. 410, suggests that Henry Pitman did not make a fortune out of his quack medicines, supposing it to refer to him: "1691. June 12, Whitehall. Passes for . . . Thomas Wilson, James Dickenson, Henry Pitman and William Muckloe to go Gravesend for Barbadoes."

His former companions after many adventures, including captivity and ill treatment by the Spaniards, returned home at last, as related in an appendix to Pitman's book.

It has been suggested that Defoe had read Pitman's "Relation," and that when he wrote *Robinson Crusoe*, thirty years after this book was published, he had in view Tortuga and not Juan Fernandez. It is true that the situation of Tortuga in the Caribbean sea and near the mouth of the Orinoco corresponds well with Defoe's description of Crusoe's island, whereas Juan Fernandez lies far away in the Pacific.

But such attempts at identification are futile. Pitman was by no means the first to be marooned on an uninhabited island, and neither from Pitman nor from Selkirk is Defoe likely to have got the wealth of convincing detail which he gives us with such wonderful verisimilitude. Probably he could get more out of an hour or two's conversation with a returned mariner, and remember the details more accurately than an ordinary person could after a year's companionship.

WELFARE OF THE BLIND.

AN OFFICIAL HANDBOOK.

THE Advisory Committee on the Welfare of the Blind, of the Ministry of Health, has just issued a *Handbook on the Welfare of the Blind in England and Wales*.[1] In his preface the Minister, Mr. Neville Chamberlain, writes:

"The handbook gives an attractive and sympathetic account of the principles which have been found most effective in helping the blind, and of the way in which they have been carried out in practice. I believe it will not only prove valuable to those who are already engaged in the work, but that it will make a wide appeal to the public, who have always demonstrated their sympathy with those deprived of sight, and some of whom may perhaps be induced, after perusing this book, to offer their services in one of the many ways in which they will be welcome."

After reading this handbook we, too, are convinced that the committee has done a most excellent piece of work. In the space of thirty-four well printed pages there is a wealth of information set out in a most attractive style. Here is everything that the sympathetic person, the social worker, the educationist, and the economist can desire to know about the blind—how best these may be helped, and how they are being helped.

Definitions and Returns.

First there is a statement of the definitions of blindness, as they affect school children and adults, and a note of some of the difficulties that attend this determination. The definition for school children "too blind to be able to read the ordinary school books used by children" has some measure of prevention attached to it; so this definition is wider than that for adults, "so blind as to be unable to perform any work for which eyesight is essential," which has a purely economic bearing. The two definitions do not coincide, and cannot, for their objects are not the same. Care is therefore needed in the choice of training of elder blind children who, though scholastically blind, may not be economically blind.

The latest return of the blind shows that there are 46,822 in England and Wales, an increase of over four thousand since the last year. The increase is due to better registration. In the past few years one of the most frequent causes of blindness was ophthalmia neonatorum; the success of preventive measures has greatly reduced its incidence, so that there will be an increase in the proportion of blindness at later ages.

Growth of Service for the Blind.

An interesting account is made of the growth of services for the blind. France has the honour of providing the first public institution in the Hospice des Quinze-Vingts in Paris, founded by St. Louis in 1260, principally for blinded soldiers. Our first institution of the sort was founded by Edward Rushton in Liverpool in 1790; he became blind on a slave ship while tending negroes with trachoma. France produced Braille and his embossed writing; England Dr. Moon and his type, which is the easier for adults to learn. England produced Mr. H. M.

[1] *Handbook on the Welfare of the Blind in England and Wales.* Ministry of Health. London, H.M. Stationery Office. 1927. 6d. net.

Taylor, the inventor of mathematical and chemical formulae which make it possible to produce scientific books for the blind, and another Taylor whose slate for teaching mathematics is used in all schools. The first legislation for the blind was in Queen Elizabeth's time; it enjoined care by relatives or by the overseers. In recent years there has been improved legislation, the codification of the Education Acts, and the Blind Persons Act. The effects of these measures are stated in the handbook.

The duties of the local statutory authorities, education and county, are now clearly defined. All the 146 councils of counties and county boroughs in England and Wales (except one just constituted) have made schemes under the Act. A comprehensive scheme includes provision for children under school age; education and training of children and of young persons and adults; employment in workshops; as home workers; hostels for the blind; homes; attention to the unemployable blind; home teaching; and registration. The work cannot be done wholesale, it demands individual attention, for the blind vary as much as normal persons, and even more.

Commenting on these provisions, the remark is made, "It is obviously in the interest of the child that it should remain at home unless the home conditions are so bad as to necessitate its removal." When the child is at home and under school age much may be done to guide parents of a blind child. Schools for the blind are now pretty complete. Training is twofold—for the children leaving school, and for those blinded in later years. Both have their own special problems. As a prerequisite it is necessary to make sure that the person is likely as a result of training to become reasonably efficient, and that there are openings for remunerative employment for him at the end of the training. Much avoidable suffering may be caused to the blind by neglect of these considerations.

Work may be done in workshops where these are near to the blind person's home, or else it must be done at home. The handicap of blindness prevents most persons from earning a livelihood if they are paid only what they earn. There must be augmentation of these earnings. How best to arrange for this and preserve the highest inducement to earn has been a problem that has needed much thought. There are given in an appendix the findings and recommendations. The home worker has special needs; he has to be helped to find his market, and there are here valuable opportunities for good Samaritans in helping him by sales of work, garden parties, and the like. Some agencies have promoted motor shops for the sale of these goods. In any case his work must be real work and no pastime. Some blind men have worked their way, by reason of their exceptional gifts, in church, law, politics, and elsewhere. The name of Milton need scarcely be cited to show how one overcame his affliction, and lived so "that I may see and tell things invisible to mortal sight." Few works of greater promise for the blind can be undertaken than constant experiment with a view to finding new occupations for them and scientific study of the work for which they are specially fitted.

The Unemployable Blind.

The tale of the unemployable blind is a heavy one; 67.6 per cent. are so classed in the latest return. Some 10 per cent. of the whole suffer other physical or mental defects. A few of these blind persons have means of their own, some have husbands who support them, others have old age pensions (for which they are eligible at 50), or pensions from one of the societies. Some receive disablement benefit, or workmen's compensation. Some are children in good homes, or parents in children's homes. Others are lonely, helpless, and destitute. The measures for the relief of these persons are considered. In the last resource "it will rest upon the local authorities under the Act as an essential part of their duty to secure that reasonable provision is made for these persons."

Home Teachers.

The pivot of the social work for the blind is the home teacher. There are 360 of them. Their work is to secure that all the blind who need visiting should receive visits systematically. They teach blind writing and reading, pastime occupations, hygiene, engage in welfare work, and introduce solitary blind to social centres. "There is no more promising outlet for the efforts of volunteers interested in the welfare of the blind than to assist in this sphere of work." But the efforts must not be haphazard, so volunteers should get their work co-ordinated by one of the local voluntary agencies, of which a list is given.

The concluding chapters deal with the organization of administration, with the place of voluntary organizations, and with the prevention of blindness. Here will be found a recommendation to read the report of the committee on "The causes and prevention of blindness" issued in 1922, which we can heartily endorse.

India.

Tuberculosis in India.

The increase of tuberculosis in India during the last fifty years was the subject of a paper read by Dr. C. Frimodt-Moller at the Fourteenth Indian Science Congress at Lahore last February, and since published in the *Indian Medical Gazette*. Dr. Frimodt-Moller attributed it primarily to the climatic conditions, and especially to the prevalence in certain areas of heavy rainfall and monsoon storms. That this is not the only cause is indicated by the severity of the disease in certain cities, such as Hyderabad (Deccan), which is favoured by a good climate, and seems to have been comparatively free from tuberculosis forty years ago. The educated classes and the more prosperous communities are believed to be becoming increasingly infected in spite of their higher level of hygiene; for this their greater exposure to infection in educational institutions is blamed. Moreover, the larger industrial centres intensify dissemination by drawing to the cities considerable numbers of the inhabitants of villages who, having contracted the disease, return home and become dangerous sources of infection for the non-immune rural populations. Improved travelling facilities are also incriminated in this respect, and in India, as elsewhere in the tropics, it is demonstrable that tuberculosis travels along the chief lines of communication. Dr. Frimodt-Moller advocates, therefore, the establishment of at least one large sanatorium in each province where the climatic conditions are suitable. These institutions, he adds, might well become centres of scientific research, with a view to determining the best ways of applying the various forms of treatment to the special requirements of Indian patients; they would also function as educational centres for medical graduates and students. Special tuberculosis hospitals of cheap and light construction should, he thinks, be erected outside the chief towns, and larger hospitals with research facilities should be constructed in the provincial capitals. He advises postponing the establishment of dispensaries until more adequate residential accommodation is available, and suggests that the dispensaries already in existence should function mainly as clearing stations for diagnosis, with special duties in regard to the detection of the sources of infection and the devising of co-ordinated preventive measures. He recommends further that a tuberculosis bureau should be organized with a view to teaching the public the dangers of infection and the use of prophylactic procedures.

Treatment of Leprosy.

Dr. Milton C. Lang, medical superintendent of the Chandkuri Asylum, Central Provinces, India, in his annual report for 1926 summarizes the results of the quarterly examinations of the in-patients at this asylum, and states that there was an average of 183 patients under treatment for a whole year, receiving two injections weekly of either pure hydnocarpus oil with creosote and olive oil, or the diluted esters of hydnocarpus oil. Of these patients an average of 85 showed improvement, 69 remained stationary, and 29 became worse. Dr. Lang considers, therefore, that treatment is very much worth while, even in the present circumstances. In the large majority of the so-called stationary cases the disease has almost

run its course, but, by treatment, the patients can be made bacteriologically negative. During the last year about one hundred patients have been removed from the treatment list, as they have passed into the class of "burnt out" cases; they have the scars of leprosy, such as the loss of fingers and toes, but they are no longer infectious, and resemble the man who shows the pock marks of smallpox but who no longer has the disease. During the current year much better results are expected. The luetic lepers will first be treated for syphilis and their progress checked by means of the Kahn test. Dr. Lang remarks that Muir and others have shown repeatedly the absolute necessity of removing predisposing causes, such as hookworm, malaria, syphilis, and other debilitating diseases, and reports an illustrative case: A woman who was progressing particularly well received three weeks' leave of absence. When she left the institution she would hardly have been recognized as a leper. While away she had a severe attack of malaria, which was untreated, and subsequently thickening on her face developed, with new nodule formation. Had the malaria been radically treated at once this would not have occurred. Dr. Lang states that each year all patients receive the carbon tetrachloride mass treatment for hookworm. Extensive stool examinations during the past year showed the incidence of this infection to be practically *nil*. He adds that hookworm is not very common in the district, but the mass treatment helps to remove any that exists. The eradication of malaria and its sequels is more difficult, but by persistent efforts considerable improvement is expected. It is now realized that not only must the leprosy be treated, but predisposing causes and debilitating diseases must be removed, when the leprosy will progress more rapidly toward arrest; if these diseases are not dealt with extensive and long-continued treatment is valueless, and tends to discredit a method which has been proved successful. During the last quarter ten patients were classified as clear of the disease—that is, so far as the physical and bacteriological examinations were concerned, they were free of leprosy. These are not called cured, but arrested cases, though there is good reason to believe that if their living conditions are suitable and they take proper care of themselves they will remain free of the disease for the rest of their lives.

MEDICAL PROGRESS IN BIHAR AND ORISSA.

There has been a steady increase in the number of hospitals and dispensaries in Bihar and Orissa during the three years 1923, 1924, and 1925. At the beginning of this period 485 institutions were at work, and during the triennium 165 new ones were opened and 52 were closed. Most of these new buildings were dispensaries in rural areas established by local authorities. An attempt is being made to provide one dispensary for each police station. In his report for the three years Colonel H. Ainsworth, I.M.S., Inspector-General of Civil Hospitals in Bihar and Orissa, states that travelling dispensaries have not been successful in this province and their number in the period under review was reduced from sixteen to three, two of which were at work in the Angul district and one in Saran. The number of patients treated annually in these dispensaries fell from over 50,000 in 1923 to 7,000 in 1925. Colonel Ainsworth suggests that in place of these dispensaries, which are very difficult to staff, greater inducements should be offered to medical practitioners to settle in the larger towns and villages where dispensaries do not exist. In some places the local authorities subsidize doctors for a term of years until they are able to establish themselves in practice. During the period under review over 10,000 patients were treated at the Patna General Hospital; over 7,000 at the Pilgrim Hospital, Gaya; and nearly 6,000 at the Cuttack General Hospital. The work in the outdoor departments of the hospitals and dispensaries increased steadily, an average of nearly 4,000,000 patients being dealt with, as compared with rather less than 3,000,000 in the preceding triennium. This satisfactory development is largely due to the provision of more dispensaries in rural areas. Cholera hospitals were established at Puri and Gaya, and in the case of a severe epidemic both can be rapidly extended. A leprosy committee has come into being to supervise the work in connexion with this disease. It has been decided to appoint a medical officer as an expert on leprosy in the provinces, and to establish special clinics wherever required to carry on propaganda, with a view to the discovery of early cases. The Radium Institute at Ranchi has increased considerably in popularity and new buildings have been erected to accommodate Indian families, Europeans, and poor patients of all classes. The quantity of radium at the Institute is 547 milligrams of the bromide and 60.6 of the element; this considerably exceeds the amount available elsewhere in India. A scheme to facilitate radium treatment by medical practitioners in India has been drawn up, but requires considerable financial support before it can be launched. During the triennium under review an attempt has been made to render the provinces self-supporting as regards the supply of medical officers. A medical school has been erected in Darbhanga and the local hospital has been enlarged to provide the necessary facilities. A college was also erected at Patna to deal with the first-year medical students; these were to be transferred last year to Darbhanga, permitting the Patna institution, which is affiliated to the University, to accommodate more advanced medical students. In the present absence of facilities at Patna for teaching in midwifery and mental diseases, arrangements have been made for students to receive clinical instruction in midwifery at Bangalore, and in mental diseases at the Indian Medical Hospital at Kanke.

PASTEUR INSTITUTE, SHILLONG.

The tenth annual report of the King Edward VII Memorial Pasteur Institute and Medical Research Institute at Shillong, in Assam, shows that 1,417 persons completed treatment for rabies during 1926, as compared with 1,176 in 1925; of this total 72 were Europeans. In 12.3 per cent. of the cases the bites were caused by jackals, the hydrophobia rate for which was calculated to be 5.2 per cent., as compared with 0.41 per cent. in those bitten by dogs. Of fourteen patients who died from hydrophobia, seven were bitten in the face. During the year antirabic vaccine was issued to medical and veterinary officers for the prophylactic treatment of bitten animals. Research work in kala-azar was continued, and the effects of two new preparations—aminostiburea and novostiburea—were tested. Very good results have followed the intensive campaign during the last year or two against kala-azar based on experimental work in the Institute, the number of patients suffering from this disease having diminished. Early in 1927 a preliminary note on a quick and simple test for distinguishing malaria from kala-azar and other fevers was published by Lieut.-Colonel E. C. Hodgson, I.M.S., director of the Institute, and two of his colleagues.

England and Wales.

VITAL STATISTICS FOR 1926.

THE Registrar-General's *Statistical Review of England and Wales for 1926*, Tables, Part II, can now be obtained from H.M. Stationery Office, price 5s. It contains statistics of the population; marriages; births; passenger movement; parliamentary and local government electors; and vital statistics of the British dominions. The total population in thousands of Great Britain and Ireland was:

	1926.	1925.	Increase + or Decrease − per cent.
England and Wales	39,067	38,893	+ 0.46
Scotland	4,897	4,893	+ 0.08
Northern Ireland	1,256	1,257	− 0.08
Irish Free State	2,970	2,985	− 0.50
Total	48,190	48,025	+ 0.34

In England and Wales the male population increased by 0.52 per cent. and the female population by 0.40 per cent. The number of marriages solemnized in England and Wales during the year was 279,860; equal to a rate of 14.3 persons

married per 1,000 persons living. This rate is 0.9 per 1,000 below that in the previous year and, with the exception of the war year 1917, is the lowest rate recorded since 1886. The births registered during the year numbered 694,563 and were equal to a rate of 17.8 per 1,000 population. This rate was 0.5 per 1,000 below that recorded in the previous year and, with the exception of the war year 1918, is the lowest rate recorded since the establishment of civil registration. Not only has the birth rate declined but the actual number of births is the lowest recorded since 1860, when the population of England and Wales was only 19,902,000, or about one-half of the estimate for 1926. The proportion of male to 1,000 female births was 1,041. This proportion showed a great increase during the war years and reached a maximum of 1,060 in 1919; since then the decline has been almost continuous and the rate is now approximating to that which prevailed in the period immediately prior to the war.

Town Dwellers' Resistance to Tuberculosis.

The relatively high resistance of town dwellers to infection by the tubercle bacillus forms an interesting subject for investigation. Dr. R. M. F. Picken, medical officer of health for Cardiff—the city chosen for next year's Annual Meeting of the British Medical Association—has begun, in his report for 1926, to collect data for elucidating the problem; and he hopes to carry out investigations, with Professor Lyle Cummins and Dr. Gilchrist, into the effect of active immunization on infants specially exposed to infection. Dr. Picken points out that, according to one theory, those who have been repeatedly exposed by town life to small doses of infection in childhood acquire a certain degree of immunity. On the other hand it has been supposed that town dwellers inherit their resistance from an immune ancestry who have been able to survive to reproductive ages in unfavourable conditions only because they possessed this power. It is hoped that, by recording the birthplace and parentage of persons suffering from tuberculosis over a series of years, and by obtaining information of the fate of infants born into tuberculous households, it may be possible to arrive at definite conclusions on the question of urban or rural nurture in relation to heredity and exposure to infection. Such conclusions would have an important bearing on the need for special anti-tuberculous measures. The statistics in Dr. Picken's report do not take one very far; but this is only to be expected with a chronic disease such as tuberculosis, in which observations over a series of years are alone of value. Moreover, the exceedingly rapid growth of Cardiff until comparatively recent years makes it improbable that many of the present adult generation had parents who were both born in the city. With regard, however, to infants born in 1926 in tuberculous homes, though the numbers are comparatively small, it appears that the mortality among them was approximately double the infant mortality of the city.

London Courses in Neurology and Psychiatry.

A post-graduate course on diseases of the nervous system will be held at the National Hospital, Queen Square, London, from October 3rd to November 25th. The general course will consist of clinical lectures and demonstrations, teaching in the out-patient department, and pathological lectures and demonstrations. The fee for this course will be £5 5s. A course of lectures on the anatomy and physiology of the nervous system will be arranged if there are sufficient applicants; fee, £2 2s. A course of clinical demonstrations, chiefly on methods of examination of the nervous system, will also be given; fee, £2 2s. Tickets entitling to attend the Out-patients' Clinic only (£2 2s. for three months) may be obtained from the secretary of the Medical School, National Hospital, Queen Square, W.C.1.

A course in advanced psychiatry will be held at the Maudsley Hospital during the same period. Times of lectures and demonstrations will be so arranged that it will be possible for medical practitioners to attend both courses. The course in psychiatry consists of three parts: clinical lectures illustrated by cases, demonstrations upon the investigation of recently admitted cases, and discussion of fully investigated cases. The fee for the whole course is £5 5s. Those wishing to take any part separately should communicate with the Director of the Medical School, Maudsley Hospital, Denmark Hill, S.E.5.

Exeter Memorial to Mr. E. J. Domville.

At St. David's Church, Exeter, on September 4th, the vicar dedicated three carved oak seats and a bench as a memorial to the late Mr. Edward James Domville, O.B.E., M.R.C.S., who was long closely associated with that church and was mayor of the city in 1893. Mr. Domville was consulting surgeon to the Royal Devon and Exeter Hospital, and for many years took an active part in the work of the British Medical Association, both locally and in central committees and the Council. He died in November, 1925, and the funeral service was held at St. David's Church. The memorial seats, bearing an inscription, are in the north transept below a stained glass window commemorating his only son, David, who died several years ago. They have been designed by Mr. W. D. Caroë, who was architect of the church.

Scotland.

Thirty Years' Progress in Public Health Work.

Sir Leslie Mackenzie, at the opening of the new pavilion of the M'Kelvie Hospital, Oban, delivered an address on the public health movement in Scotland since 1889. He said that the public health movement in Scotland really began about that year. The many problems covered by the official names "maternity service" and "child welfare" were increasingly realized by the public imagination. With the new extension of the hospital which had just been opened the corporation of Oban would possess an effective modern hospital of 42 beds. The new extension would permit the local authorities to deal with cases of infectious diseases such as measles, ophthalmia neonatorum, and whooping-cough occurring in children. Thirty years ago compulsory notification was made universal in Scotland, and the list of notifiable diseases now approached thirty. In these thirty years medical men had notified 1,450,818 cases, and of these 770,000 had been removed to hospitals under the management of the local authorities for public health. These great numbers gave an idea of the problem that constantly faced public health authorities in Scotland. Notification of pulmonary tuberculosis had been carried out since 1906, and 137,705 cases had been notified in that period. The annual figures had been as high as 9,000, though recently there had been a falling off till, in 1926, the number notified was only 6,669. The total notifications for all cases of tuberculosis had been 189,159, of which 83,354 had been removed from their homes for treatment. In the early years of notification the annual figures for typhoid fever had been as high as 5,600, but in recent years they had never exceeded 800, and in some years the cases of this disease had fallen below 400. It appeared, therefore, that typhoid fever was now under effective control. As to typhus fever, this disease had fallen off so much that occasionally a year passed without a single case. In 1926 only one case of small-pox had been notified in Scotland, and small-pox also was therefore under effective control. Finally, new methods of dealing with scarlet fever and diphtheria had been introduced and were already beginning to have effect in diminishing these diseases.

Central Midwives Board Examinations.

At the examination of the Central Midwives Board for Scotland, held simultaneously in Edinburgh, Glasgow, Dundee, and Aberdeen, lately concluded, out of 91 candidates who appeared for examination 83 passed. Of the successful candidates 13 were trained at the Royal Maternity Hospital, Edinburgh, 27 at the Royal Maternity Hospital, Glasgow, 5 at the Royal Maternity Hospital, Dundee, 4 at the Royal Maternity Hospital, Aberdeen, 13 at the Queen Victoria Jubilee Institute, Edinburgh, 2 at the Elsie Inglis Hospital, Abbeyhill, 5 at Stobhill Hospital, 3 at the County Maternity Hospital, Bellshill, and the remainder at various recognized institutions.

Correspondence.

EPIDEMIOLOGY OF POLIOMYELITIS.

SIR,—I note with regret the terms in which Dr. James Collier (September 10th, p. 468) has felt compelled to challenge the accuracy of a summary of his views on the epidemiology of poliomyelitis contained in a paper of mine on that subject in the JOURNAL of August 27th last (p. 347).

The summary in question and the deductions drawn therefrom were formulated after a most careful study of Dr. Collier's opinions, as expressed in the JOURNAL on April 23rd (p. 751), and were certainly not intended to impute any wilful inaccuracy of statement to him, nor indeed do I think that the careful reader will find anything of the kind in them.

Although our respective views on these disputed points are on record in the pages of this journal for all who may be interested to assess their relative value and accuracy, yet since the subject is of more than purely academic interest and importance it is as well that the issues should be made as clear as possible, and that any confusion arising from merely verbal obscurity should be dissipated. Therefore, although there is nothing in my paper which I wish to modify, the challenge to its fairness and accuracy is so emphatic that I may be allowed to give the authority upon which the disputed passages are based.

In the first place it appears from his letter that Dr. Collier and myself are no longer at one in our use of the term "carrier." I take this to refer to an individual who, while he harbours a given pathogenic organism, is himself free from the disease to which this organism gives rise. By a "carrier epidemic" I understand the prevalence at a given time and place of numbers of such individuals harbouring some particular pathogenic organism, the associated disease being itself not present.

Throughout his paper Dr. Collier gives indications that hitherto he also has understood these terms in the above sense, yet in his letter he appears to use them in another and a less precise sense, and one involving a material change in his views on the question of case-to-case infection. Thus, in his paper he says: "though the virus can be obtained from the mucous membrane of cases for some days after the disease has appeared, and monkeys can be inoculated with the disease from this virus, that does not mean for one moment that a patient even in the early days of his illness can deliver an infective dose of the virus to another person. There is strong evidence that a case of poliomyelitis is not infectious, and that a carrier, especially a recent carrier, may be very infectious." Further, "the disease is never transmitted by the one who is suffering from it, but only by the carriers." And finally, "When an epidemic of poliomyelitis occurs in a community it is preceded by a carrier epidemic in which for a time no cases occur but many carriers are made, and . . . with the increasing advent of carrier infection to susceptibles the virulence of the infection is raised and at last definite cases occur. . . . Such a preceding carrier epidemic best explains the curve of incidence in an epidemic, with its rapid blaze, high peak, and rapid fall, all the cases occurring within a few days and then no more cases. . . . It follows that when a case of poliomyelitis occurs in a semi-isolated community such as a school which has been assembled, say, for several weeks, there has already been a carrier outbreak going on for some time, and all the boys are already infected as cases or carriers or they are immune. The actual cases are not infectious, and all the damage that can be done has been done so far as the boys are concerned.

These statements, which might be added to considerably, not only afford ample confirmation of the accuracy of my summary, but indicate that the writer uses the term "carrier" in the accepted sense, regards the carrier as the sole vehicle of infection, and places sufferers from poliomyelitis in a separate category. In his letter, however, Dr. Collier now says that by carriers he also means sufferers from poliomyelitis in the incubation period. "Is not every case of poliomyelitis of necessity a carrier during the incubation period," he asks, "since this is a nasopharyngeal infection and readily communicable by droplet infection?" In short, it is by virtually abolishing the distinction between carrier and sufferer—between carrier epidemic and disease epidemic—that Dr. Collier impugns the accuracy of my summary of his views. What are we to understand by a carrier epidemic on this new definition? May it be nothing more after all than an outbreak of definite cases of poliomyelitis during their few days of incubation? If this be so, nothing is left of the theory of the carrier epidemic and of the non-infectivity of cases of poliomyelitis.

The other objections to my paper appear to be based upon similar qualifications of previously expressed views, and they are, in my opinion, fully met by the quotations given above. It remains only to refer to the question of the figures in the Stokes Rivers epidemic.

I cited that outbreak as evidence that in the matter of day-to-day case incidence, multiple cases in households, and the non-immunity of persons not infected at the outset, epidemics of poliomyelitis do not present the features ascribed to them by Dr. Collier and do not allow of the interpretation he has put forward. The total case incidence is a matter of no importance in this connexion, and the difference in our respective figures is due to the fact that Dr. Collier has included nine cases described in the original report as doubtful, thus bringing his total to 45, while I have confined myself to the 36 cases in which the medical officer of health was satisfied as to the diagnosis.

It is surely clear enough that my criticism of Dr. Collier's reference to the outbreak lies in his description of it as "a swift scourge which . . . could lay low in a few days," whereas actually the total of 36 (or 45) cases occurred over a period of forty days, not more than two fresh cases developing on any one day. I still believe that this criticism is valid and material to the question at issue between us.—I am, etc.,

London, W.1, Sept. 11th. F. M. R. WALSHE.

TONSILLECTOMY AND CONSERVATIVE TREATMENT.

SIR,—Dr. Walker in his letter on tonsils and rheumatism (September 10th, p. 470) is most happy in his description of the practice he adopts in the nose and throat department of the Aberdeen Dispensary—namely, that "of attempting conservative treatment whenever there seems to be some prospect of success," though in the majority of these cases he is "forced eventually to resort to tonsillectomy." This attitude and this experience are in accord with my own and those of most moderate-minded practitioners.

In the attempt to succeed with conservative treatment I have found that *a penetrating local application of iodine* has been very efficacious, even to the extent of "doing me out of" an expected tonsillectomy. The application consists of: iodine 5 grains, acetic ether (acid-free) 2 fluid drachms, and glycerin up to 1 ounce. This has to be well shaken and brushed into the tonsils. The acetic ether adds to the pleasantness of the taste and appears to carry the iodine into the depths of the tonsillar crypts. I have verified this by painting tonsils with this solution and causing the patient to swallow several times previous to their removal. After the removal I divided them at right angles to the surface and dropped on the cut part a solution of starch. A reddish-purple tint was then, and only then, produced, extending very deeply into the crypts. The experiment was controlled by the application of starch to sections of tonsils not painted with iodine, when no such coloration was visible.

As a prophylactic gargle for the tonsils *thymol water* has a great reputation, which I think is quite justified. A culture taken by Dr. Carnegie-Dickson from the tonsils after a gargle of plain warm water was found to afford a copious crop of colonies of the usual microbic inhabitants of the mouth. After a gargle with thymol water and again with simple warm water such colonies were extremely few. A condition of such effects is that the thymol water should not merely be slopped about the root of the tongue, but should be allowed to pass into the back of the throat while the head is thrown well back and the movement of swallowing performed without, if possible, allowing the fluid to slip down the gullet.

Caseous masses filling the crypts may be cleared away by means of a fine dental syringe with the point bent at a right angle, charged with hydrogen peroxide (equal parts of the ten-volume solution and warm water). Such accumulations are often concealed behind the plica triangularis. The relief afforded by such syringing is often very considerable and prolonged. In the case of a gentleman who had come over from Australia with such pain and discomfort that nothing would convince him that he was not suffering from cancer, the relief following the washing out of a mass of the size of a pea was so extraordinary that he jumped up and exclaimed that his trouble had completely gone.

In giving the conservative treatment a fair chance these simple suggestions will be found useful, while still leaving a sufficient number of tonsillectomies for those who wisely perform the complete enucleation in appropriate cases, seeing the gratifying results as regards local comfort and general health.—I am, etc.,

London, W.1, Sept. 12th. JAMES DUNDAS-GRANT.

A TREATMENT FOR ASTHMA.

SIR,—I regret very much that your powerful JOURNAL should, in its leading article of August 27th (p. 355), have "damned with such faint praise" the valuable results of Professor Storm van Leeuwen's investigations with regard to the causes and treatment of asthma and the other allergic diseases.

Your criticism on Storm van Leeuwen's alleged views as to kapok pillows is in reality a strong vindication of his theory of the importance of moulds in asthma. He has never said that *per se* kapok is an exciting cause of asthma. He simply regards kapok as a good culture medium for the *Aspergillus fumigatus*. In the Swiss mountains this and similar moulds are not found; consequently it is a matter of indifference whether the pillow used is kapok or feathers, provided it has not been infected before being brought to the mountain heights. The freedom of asthmatics from symptoms at these heights is no doubt due to the absence of these moulds and other allergens.

I have had personal experience of Professor Storm van Leeuwen's treatment in an allergen-free chamber, as I slept in one for over four weeks in his clinic at Leiden. I was not a pure climatic case, and did not gain entire freedom from asthmatic attacks while sleeping in it, as did the great majority of the other patients who were in the clinic at the same time as myself, but the number and severity of my attacks decreased and my general health improved markedly.

The mere fact that it is alleged that cacti alone can be grown in allergen-free chambers is no proof at all that the chambers are unhealthy for man. Who tried to grow the plants? A good doctor is not necessarily a good gardener. Owing to the rapid change of air in the chamber excessive evaporation goes on. Was this allowed for? Allergen-free chambers are meant for sleeping in, not living in throughout the day, consequently it is not of vital importance to have them as well lighted as an ordinary day room. Owing to the difficulty of making sure that they are hermetically sealed the usual practice is to have only one window in the room in which the chamber has been erected. How much sunlight was there in the allergen-free chamber in which the attempt to grow plants was made? Without details as to these and many other questions that would suggest themselves to a practical gardener, it is impossible to form a judgement as to the correctness of the statement that cacti alone can be grown in allergen-free chambers. The clinic in Leiden is in an improvised building overshadowed by trees, and I should regard it as anything but a suitable place for experiments on the growth of plants in allergen-free chambers.

The most valuable of Professor Storm van Leeuwen's statistics as to the benefit of allergen-free chambers in the treatment of asthma are based, not on the temporary freedom from attacks in asthmatics admitted to his clinic, but on the continued freedom from attacks in patients who have been sleeping in allergen-free chambers erected in their own homes. Professor Storm van Leeuwen regards the allergen-free chamber treatment as his most important contribution to the treatment of asthma, and from the results that I saw in the clinic at Leiden I entirely agree with him.

I feel very strongly on the subject of the treatment of asthma in England, as I have recently been absent from my practice for eight months, owing to "asthma of the continuous type," which commenced at the age of 55 after my first attack of bronchitis. In spite of treatment by some of the most distinguished men in Harley Street, nasal cauterization, irrigation of my antrum, change of climate to various places abroad, including Biskra in Algeria, I became worse instead of better. It is entirely due to the results of the investigations of Professor Storm van Leeuwen during the past eight years that I have gradually improved till I am now able to undertake full duty, and hope, if I can find an English firm enterprising enough to erect an allergen-free chamber in my own house, to be absolutely free from asthmatic symptoms.

Whatever we may say to the contrary, it is a fact that it is the practice in England to regard asthma as a pulmonary neurosis, hopeless from the point of view of treatment except by a change of climate. So long as we maintain this attitude, so long will we lag behind men like Storm van Leeuwen, who are earnestly and scientifically investigating causes and searching after possible methods of treatment of this incapacitating disease.—I am, etc.,

Newbury, Berks, Sept. 4th. D. KENNEDY, M.D.

SIR,—In your leading article on "A treatment for asthma" (August 27th, p. 355) you kindly mention my name, but suggest that there are difficulties in harmonizing my work with that of Professor Storm van Leeuwen, particularly with regard to the use of feather and kapok bedding.

As you state, I believe most firmly in the value of the dermal reactions, and cannot do otherwise after seeing the scores of patients who have lost their asthma entirely by avoiding those proteins to which they are proved sensitive.

Where van Leeuwen uses the individual moulds I have obtained specimens of dust from patients' own houses, and if they gave reactions to such dusts I have made suitable dilutions and desensitized the patient to the dust. Further, when Professor van Leeuwen was lecturing at the Royal Society of Medicine in 1924 I spoke and passed round culture tubes full of moulds showing that house dust consists chiefly of mould spores. The fact that Professor van Leeuwen has discovered that patients may be sensitive to individual moulds is extremely interesting, and constitutes a valuable addition to the long list of proteins to which patients may be sensitive, but I do not think these moulds take the place of the other proteins. It is not yet proved, I believe, whether it be the spores of these moulds floating about in the air, or some substance broken off from the proteins on which the moulds are growing, that constitute these air-borne allergens.

In my opinion patients may be sensitive either to feathers or kapok or moulds as present in house dust, or to any one or more of these, and I hold that every case of asthma should be efficiently tested to every protein with which the patient comes in contact. I recently had the pleasure of seeing Dr. Rackemann of New York, who entirely agrees with this preliminary investigation of every case of asthma. These reactions are extraordinarily specific. If a patient is sensitive to feathers alone he will be relieved of his asthma if put on kapok bedding. If kapok is in common use in Holland one would naturally expect many patients to become sensitive to it, just as they do to bedding stuffed with straw, chaff, and hay in other places. If a patient is sensitive to house dust and moulds he will have trouble wherever those moulds are to be found growing, including all forms of bedding that have been any time in use.

There are many intermediate stages and factors at work by which these proteins eventually bring about an attack of asthma, and there may well be other influences stopping the asthma at high altitudes besides an absence of dust and moulds. We may compare the amenorrhoea and other

menstrual disturbances that take place on the high tablelands of South Africa.

I shall at once add these moulds to my test proteins and shall be extremely interested to watch the results, as I think Professor van Leeuwen's work will probably constitute a great advance in the treatment of asthma.—I am, etc.,

FRANK COKE.

London, W.1, Sept. 10th.

THERAPEUTIC ABORTION.

SIR,—I am in complete agreement with many points in Mr. Cook's letter in your JOURNAL of August 27th (p. 368) as to the influence which starvation and dehydration have in the vomiting of pregnancy. I am also in agreement with the treatment as outlined by him, but I am glad to notice that it is "in the vast majority of cases" that this treatment is successful. The trouble is in the minority where the treatment fails.

Therapeutic abortion represents a confession of failure of that line of treatment; to sign the patient's death certificate is the complete confession of absolute failure.—I am, etc.,

Edinburgh, Aug. 31st. H. S. DAVIDSON.

FELO-DE-SE?

SIR,—I have recently attended a woman who died of peritonitis. In the belief that she was pregnant, and with the intention of producing an abortion, she had herself, ten days previous to her death, passed a foreign body into her uterus. As a matter of fact she was not pregnant, nor had she recently been so; of this I am perfectly satisfied. I placed the whole facts before the coroner, who held an inquest without a jury and returned a verdict of "*felo-de-se*." I shall be obliged if you, or some reader whose forensic knowledge is more expert than mine, will inform me if this verdict was according to law. According to my reading of the law it was not. The law is thus expressed: "Every woman *being with child*, who, with intent to procure her own miscarriage, shall unlawfully, etc. . . . and whosoever with intent to procure the miscarriage of any woman, *whether she be or be not with child*, shall unlawfully, etc." (Italics mine.) The salient points in the case I quote are that the woman was not with child and that no other person was concerned in the act which caused her death.—I am, etc.,

Urmston, Manchester, Sept. 3rd. SYDNEY A. WINSTANLEY.

*** *Felo-de-se*, as the name suggests, means one who feloniously commits self-murder, he being a felon with respect to himself. Dr. Winstanley correctly quotes from Section 58 of the Offences against the Person Act of 1861, which constituted abortion a felony, and it will be seen that a distinction has been drawn between the case of a person who endeavours to procure abortion upon herself and the case of a third party who attempts to procure abortion upon another, and that in the case of the former an essential element is that the person charged should be with child. In the case of Regina *v.* Whitchurch, which was decided in 1890, it was held by Lord Coleridge, C.J., that a woman who was not with child could be convicted of a conspiracy with a third person to procure abortion, though if she stood alone she could not be guilty of the intended offence, having regard to the wording of Section 58 before referred to. This is the nearest we can find to a direct decision upon this point, though the wording of the Statute is so clear that a definite ruling would hardly be expected, as the prosecution of a woman who had either used an instrument or taken a noxious drug to procure abortion would not be likely to succeed unless she was in fact with child. From this it follows that the woman was not in fact guilty of a felonious act in making use of the means in question, as she was mistaken in her belief that she was with child. The coroner, therefore, would appear to have been technically incorrect in returning a verdict of "*felo-de-se*"; she was not a felon towards herself, as it could not be described as self-murder, the essential elements of murder being absent.

DRIED COMPLEMENT IN THE TROPICS.

SIR,—In some tropical areas guinea-pigs are troublesome to breed and supplies difficult to obtain. Dried complement, if active, would be invaluable to the pathologist working in such regions. For some time past a preparation has been available, and during last April a small quantity from a German source was received by Dr. W. Fletcher, the director of the Institute for Medical Research, Federated Malay States, who handed it to me for testing.

The material was packed in sealed glass ampoules, each containing 0.1 gram. A solution of this quantity in nine times its weight of distilled water was claimed by the manufacturers to result in a solution equivalent to the original guinea-pig's serum. The contents of three ampoules was taken up in 2.7 c.cm. of water, but the resulting solution was, however, turbid and filtration was performed before proceeding to an evaluation test.

Estimation was carried out according to the technique of Fildes and McIntosh (Method III, Medical Research Council, Special Report Series, No. 14), except that the number of tubes in each row was increased to eight in order to allow of an increasing dosage to 0.5 c.cm. of diluted complement. (The dilutions employed were 1/24 in the no antigen row and 1/8.5 in the antigen row.)

Incubation for fifteen minutes resulted in partial haemolysis only in the last tube. After an hour the corpuscles in the tube containing 0.5 c.cm. of diluted complement were completely lysed, but haemolysis was still incomplete in the 0.45 c.cm. tube. A control with local guinea-pig's serum showed complete haemolysis in fifteen minutes with 0.15 c.cm. of a similar dilution.

Sufficient complement for the usual Wassermann test (2.5 M.H.D.) would thus be contained in 0.5 c.cm. of a 1/10 dilution of serum reconstituted from the dried material. Such a low concentration of fresh guinea-pig's serum should not be employed for the Wassermann reaction, because the presence of a large quantity of serum during the test is likely to lead to fallacious results. If the sample tested was a representative one it is thought that dried guinea-pig's complement cannot be of value in tropical laboratories until the loss of complement, which occurs in preparation, has been considerably reduced by improvements in the drying process.—I am, etc.,

A. NEAVE KINGSBURY, M.B., B.S.

Institute for Medical Research,
Federated Malay States, July 23rd.

SINUSITIS.

SIR,—In your issue for June 4th (p. 1004) I read an article by Dr. Leonard Mackey on sinusitis in children. A few years ago I made some special observations on sinusitis in patients attending my medical clinic, and in a series of 391 consecutive cases I found 26.5 per cent. had definite evidence of sinusitis. This was rather staggering. This condition is the cause of endless amount of disease, as it is a focal infection, and allows of the entrance of organisms to the blood stream, as does any other focal infection. It has been obviously overlooked in the past as a source of disease. This is very much so in goitre associated with exophthalmos. One very important factor I would like to emphasize is the finding of multiple infections, infected tonsils, sinusitis, and pyorrhoea. This is so common that one is almost forced to the conclusion that the same organisms are responsible for all. I think tonsils are infected at a very early age from the parents; dental caries follows with adenoids and nasal infection, and later pyorrhoea. Disease of any organ or tissue is possible from this source, but especially hilus thickening and chronic bronchitis with or without asthma. I have not, since I have been looking for it, been able to find a case of bronchitis or asthma without sinusitis, and I have not failed to clear up or greatly mitigate every case of asthma. All the drainage from these infected sinuses passes down the chain of glands in the posterior angle of the neck into the mediastinal glands at the bifurcation of the trachea. The infection gradually spreads along the bronchi, giving the characteristic hilus thickening which is so often suspected of being tuberculous. The diagnosis of sinusitis is really very simple. The mere presence of a yellow post-nasal discharge unassociated with definite colds is absolute evidence. It may be intermittent or more or less constant. Headaches are almost always present except in pure antral cases. Sinusitis is the cause of at

least 90 per cent. of headaches with which humanity suffers. In the treatment of this very widespread disability we very fortunately have almost a specific in the action of colloidal manganese. My percentage of cures has been 90 per cent. in the general run of cases, but in purely antral cases only 50 per cent. Where there is marked polypoid degeneration or low grade involvement of bone I have known nothing but time to give any good results.

Sinusitis in children is far more common than is suspected. All children with chronic running noses have sinusitis. In dealing with them cure can be obtained by giving them a quarter of a grain of potassium permanganate twice a day a quarter of an hour before morning and evening meals in a pill. I discarded vaccines five years ago as very unsatisfactory.—I am, etc.,

SYDNEY PERN, M.R.C.S., L.R.C.P.

Melbourne, Victoria, July 20th.

TREATMENT OF GONORRHOEA.

SIR,—I have tried the treatment of gonorrhoea with hydrogen peroxide advocated by Dr. Cock (August 13th, p. 267) on many occasions, but with doubtful results. If injections are preferred, or for private reasons have to be used, I find the old-fashioned and generally discarded zinc salts as good as any, especially the sulphocarbolate. I have tried most of the new silver preparations, from protargol onwards, but have not been much impressed by them. Concerning irrigation, I think that the chief action is mechanical, and due to simple lavage. The gonococcicidal action of any drug used in this way must be slight, for the drug is not long enough in contact with the gonococci to produce much effect. Permanganate is certainly one of the best preparations to use because, in weak dilution, it is harmless to the urethra. I conclude with a word of warning against the "sealing up process" with argyrol, practised chiefly, I believe, in America. I have had cases treated by others in this way with disastrous results. The only way to abort gonorrhoea is to catch the gonococcus early (within twelve hours of first appearance of discharge) and treat by injections of any gonococcicidal drug preferred. —I am, etc.,

C. F. MARSHALL, M.D., F.R.C.S.

London, E.C.3, August 27th.

POOR LAW MEDICAL SERVICE.

SIR,—After perusal of this year's Educational Number of the JOURNAL I observe that, among the public services offering a medical career, there is no mention of Poor Law as being in the field of consideration. I know that this service is much discussed by the recently qualified as offering a possible career, and it appears to me that some remarks upon it should prove useful, particularly in view of rapid advances in recent years and of the likelihood of further changes for the better.

In these days of professional overcrowding, no avenue of medical interest and livelihood should be left unexplored. Poor Law offers as good a career as any other public service, provided one is forewarned of difficulties and dangers. London and the large provincial cities have to-day finely equipped hospitals and infirmaries under purely medical administration, offering possibilities which cannot be ignored. There are also a number of full-time non-residential or "district" appointments, and a still larger number of part-time appointments forming most valuable adjuncts to general practice.

Taking the average case of the young man with one or two general hospital appointments behind him and little or no capital, Poor Law deserves his consideration with other services for the following reasons.

There are large numbers of posts as resident assistant medical officers in Poor Law hospitals and infirmaries at salaries from £200 to £450 with full keep, and sometimes extra fees as well. The duties are much the same as those of a house-physician or house-surgeon in a general hospital, with the following advantages:

1. The larger salary makes it possible to save a little capital for entry into general practice, while having the opportunity to observe a suitable opening, and at the same time serving a most valuable apprenticeship. A part-time appointment may also be available to augment practice or partnership.

2. There is ample time and material in most cases for preparation for the higher qualifications, with introduction to consulting practice and paid consulting appointments.

3. An introduction to Poor Law as a permanent career. Medical superintendents of Poor Law are paid from £600 to £1,600 *plus* house, light, coal, etc. First assistant medical officers are paid from £400 to £700 *plus* the above allowances. There are also full-time non-resident district medical officers, drawing salaries from £600 to £1,100, frequently with car or other allowances.

There is but one type of Poor Law appointment which requires a word of warning. There are still Poor Law institutions where the bulk of the inhabitants are sick, senile, or simple-minded, which remain under the administrative control of a workhouse master with his wife as matron. Full-time resident medical appointments in such places are only worthy of consideration either as a very temporary stop-gap, or where it is assured that administrative changes are imminent, either by complete separation of the sick and infirm from the rest under medical administration, or by the erection of an entirely new hospital. No matter what the personalities of doctor and master may be, if the proportion of medical work is large —and it must be to necessitate a resident doctor—the lot of the doctor is an unenviable one. He finds himself taking a markedly second place to the master and matron (man and wife) in work which is essentially medical. This, of course, is absurd. I am not attacking workhouse masters and matrons in their proper sphere, but the system which permits of their retention in institutions which have far outgrown their original status of workhouse. I have had personal experience of this in an institution containing many hundreds of sick and infirm out of a total of about a thousand. The place I have in mind is a training school for nurses, assists in the training of students, has some hundreds of operations annually, a consulting staff, *x*-ray plant, laboratory, etc. It was, and still is, under the control of a workhouse master and his wife as matron. The difficulties in such a place render the whole position serio-comic.

It appears to me that the best and worst of Poor Law as a possible career should receive some publicity. There is a marked and increasing tendency on the part of the newly qualified to weigh the full-time public appointment, particularly with house, etc., provided, security of tenure, and a pension in later years, against the exigencies, uncertainty, and worry which beset the young beginner in general practice, unless he is provided with adequate capital for a secure start. The facilities which Poor Law can offer entitle it to its share of consideration with the other public services in the difficult task of reviewing possible careers. Looking at the question broadly, it appears to me to be very doubtful whether any other public service can show any greater all-round advantages. I am, etc.,

D. CYRIL THOMAS,
Medical Superintendent, Battle Infirmary, Reading, Berks.

September 4th.

*** Dr. Cyril Thomas's letter enables us to repair an undesigned omission.

ALCOHOL AND THE MOTORIST.

SIR,—Muscular inco-ordination is stated to be one of the signs of drunkenness. Muscular inco-ordination may occur in a motorist who has taken *no* alcohol.

Recently I had occasion to drive well over 200 miles in the day. The first 30 miles were driven before lunch, the remaining 180 or more were driven straight off. I started at 4.30 p.m., and finished up between midnight and 1 a.m. The last 70 miles were driven in the dark over known roads, with some rain during the last hour. I ate sandwiches while driving, and stopped two or three times for adjustments and petrol. I had no alcohol whatever during the day; the previous night I had one glass of whisky on going to bed. I was in fit condition and had driven nearly 200 miles the previous day. I have rather high

myopia, but no night blindness. About 70 miles from home I stopped for petrol, and then noticed nothing amiss.

On arriving home and getting out of the car my legs felt wobbly, but that I put down to sitting so long. Having put the car away I had some cake and milk—no alcohol. Half an hour later, on going to bed I found my legs still somewhat erratic, so much so that I remarked to my daughter, who had accompanied me, that it was lucky I had not met the police or they would surely have thought me drunk. On lighting my candle I found that my hand was unsteady. I did not feel excessively tired. I slept well and was perfectly normal next morning.

It was the duration of the inco-ordination that struck me as unusual—upwards of half an hour. I did not attempt to sit up to see how long it would last.—I am, etc.,

Weobley, Herefordshire, Aug. 29th. JOHN S. CLARKE.

PREGNANCY AND GLYCOSURIA.

SIR,—I read with interest Dr. Kean's memorandum on the subject of pregnancy and glycosuria, which appeared in the BRITISH MEDICAL JOURNAL of July 16th (p. 100). I fail to understand why the case referred to should not have been considered a possible case of lactosuria. The relationship between the appearance of the reducing substance in the urine and the presence of milk in the diet is significant. The subjective symptoms experienced by the patient coincident with the bouts of "glycosuria" are certainly unusual in true cases of diabetes mellitus.—I am, etc.,

A. J. HAWE, M.B., D.T.M.,
West African Medical Service.

Accra, Aug. 8th.

COURTESY CALLS.

SIR,—Up to a few years ago it was the custom for a man settling in practice to call upon his neighbours. Since the war this custom seems almost entirely to have died out.

The advantages to both the old-established practitioner and the newcomer are so obvious that it is not necessary to take up your space by recapitulating them. It does, however, seem worth while to point out that in the publication designed for newly qualified men this ordinary piece of common courtesy and medical etiquette should be dwelt upon, and I therefore ask the hospitality of your columns.—I am, etc.,

Liverpool, Aug. 27th. G. F. RAWDON SMITH.

*** Adherence to this custom is strongly recommended in the *Handbook for Recently Qualified Medical Practitioners*, published by the British Medical Association. The paragraph relating to it is as follows:

27. A practitioner newly settled in a town or district—deputies, assistants, and holders of public appointments excluded—should call upon his professional colleagues, and this should be done as soon as possible. The call is an act of civility which announces also the newcomer's proper claim to professional recognition and acquaintance. Any such call should, of course, be returned. The professional colleagues to whom this courtesy should be extended are, generally speaking, those with whom the newly arrived practitioner is likely to come into contact. The first visit may well be paid to the Chairman or Honorary Secretary of the B.M.A. Division in which the practitioner has come to commence practice.

POISONING BY OIL OF EUCALYPTUS.

SIR,—In the BRITISH MEDICAL JOURNAL, June 4th (p. 1005), Dr. Gibbin reports a case of poisoning by eucalyptus (blue gum), and adds that he finds no textbook records.

In the *Australian Medical Gazette* of June 20th, 1914, there was an article by Dr. Burton Cleland (Government microbiologist) dealing with Australian poison plants; referring to eucalyptus he cites from the BRITISH MEDICAL JOURNAL, February 18th, 1911, a summary by Dr. Foggie of blue gum poisoning. In it a case of my own is mentioned—the death of a boy from the oil in 1914 in Tasmania, with *post-mortem* results.—I am, etc.,

Sydney, July 22nd. ALFRED NEALE, M.D.

Obituary.

WILLIAM THELWALL THOMAS, M.B.E., CH.M., F.R.C.S.,

Consulting Surgeon, Royal Infirmary, Liverpool; Emeritus Professor of Regional Surgery and Clinical Lecturer in Surgery, University of Liverpool.

WE regret to announce the death, which took place with tragic suddenness at his residence in Allerton, Liverpool, on September 10th, of Mr. W. Thelwall Thomas, the distinguished surgeon. To the knowledge of some of his colleagues, Mr. Thelwall Thomas had been in indifferent health for some months, and he recently had the misfortune to lose his wife after a painful illness. But he stuck manfully to his work, and performed an operation, with his usual brilliance and attention to detail, on the morning of the day he died. The summons came to him as he would have wished, while he was still in harness.

William Thelwall Thomas was the son of the late John and Elizabeth Thomas of Liverpool, and was born in that city in 1865. Ambitious from his youth, and endowed with great mental vigour, he early decided to enter the medical profession and, after completing his school education at the Liverpool Institute, he proceeded to Glasgow and enrolled as a medical student. In the Royal Infirmary there he came under the influence of men who were carrying on the work in antiseptic surgery initiated by Lister. Part of his training he received in the Royal Infirmary and Medical School of his native city, and in 1886 he passed the examinations for the M.R.C.S.Eng. diploma, and in the same year took the Scottish triple qualification. Thereafter he filled resident posts on both the medical and surgical sides in the Liverpool Royal Infirmary, and subsequently acted for a time as assistant lecturer in anatomy at University College, Liverpool, being Holt Scholar in 1887. In 1890 he was admitted to the Fellowship of the Royal College of Surgeons of England. This opened the way for his admission to the surgical staff of the Liverpool Royal Infirmary, where he became assistant surgeon in 1892. His conspicuous abilities as a surgeon were at once recognized by his colleagues. He was a man of ready resource, a fine surgical diagnostician, and a brilliant operator, with a gift for attention to detail.

In due course, after sixteen years, he was promoted to the full staff, and on his retirement two years ago, on reaching the age limit, he was appointed consulting surgeon. In addition to his hospital work and the demands of a very extensive surgical practice, which took him all over the north-west of England and far into the heart of Wales, he found time to fill the posts of professor of regional surgery and lecturer in surgery at the University of Liverpool. A man of genial nature, who knew what it was to fight against unpropitious circumstances, he had a fine sympathy for his students and an excellent understanding of their difficulties. By them and by his house-surgeons he was much beloved. He had excellent didactic gifts, and could drive home the salient points in a difficult case with precision and certainty, so that students who followed his ward clinics had little difficulty in picking up an excellent knowledge of surgical practice; while those who worked with him in the theatre had a constant demonstration, not only of fine technical skill, but of conscientiousness of an unusually high order. In his university lectures he made great use of the pictorial method of imparting instruction, believing that mental impressions conveyed through the eyes were not only more valuable in surgery, but were also more readily grasped than impressions received through the ears. He presented an epidiascope to the University, and made constant use of it in his lectures.

Tradition says that Thelwall Thomas was the first surgeon to introduce a sterilizer into the Liverpool Royal Infirmary—in the shape of a five-shilling fish kettle. One of the first surgeons in Liverpool to put into full practice the antiseptic method, he soon proceeded to asepsis, and he was largely responsible for establishing a theatre technique of the highest order, which has been of incalculable benefit to those junior colleagues who have followed him. Endowed with a singularly receptive mind, he was no blind follower

of fashion. Up to date in all his methods, he refused to adopt new procedures simply because they were novel. He had a singular gift of appraising the value of a new procedure, and no operation was too daring to daunt him. But with him the safety and comfort of his patients came first. He was not prepared to subject them to new and comparatively untried surgical procedures if he was not convinced that the new method would render them and him better service than the old. He introduced several novel "gadgets"—for example, the detempered needle, and black silkworm gut, and the large-handled Spencer Wells forceps. He brought to a fine perfection his operation for haemorrhoids by suture over the face of the clamp. This operation has entirely displaced from hospital practice in Liverpool the old-fashioned operation by clamp and cautery. And simultaneously with the Mayos, in 1903, he introduced the transverse incision in the operation for umbilical hernia. In renal surgery he was responsible for the introduction of the double incision for stones occurring simultaneously in the kidney and distal end of the ureter; and, with the late Professor Benjamin Moore, he instituted an investigation into the chemical nature of renal calculi. This investigation altered completely our knowledge of this subject. All of the stones examined were proved to be of calcium oxalate. Previously they had been regarded as being composed of uric acid and urates.

Thelwall Thomas made many contributions to the literature of his subject, all of which were characterized by a simple directness and an entire absence of unnecessary detail. He was a practical man—not a word-spinner. He contributed the article on surgical shock to the *Encyclopedia Medica* in 1903. His many writings are too numerous to mention in detail, but attention may be called to his report on "Fifty cases of hour-glass deformity of the stomach," which was published in the *British Journal of Surgery* in 1921; to his numerous papers in the *Liverpool Medico-Chirurgical Journal*; and to his two addresses as president of the Liverpool Medical Institution on "The evolution of the voluntary hospital and its future," and on "The evolution of the surgeon and his training." He took a regular part in the discussions at the Liverpool Medical Institution and constantly exhibited interesting pathological specimens. His capacity for hard work was enormous. As an instance may be mentioned the fact that during the war he worked practically single-handed on the surgical side in the Liverpool Royal Infirmary, and the number of operations performed by him alone almost equalled the full complement under peace-time conditions.

He was, with Mr. Paul, a pioneer in Liverpool in abdominal surgery, and his careful technique, coupled with his executive ability, which was of the highest order, gave him the most excellent results. Honours came to him as he grew older. After the war he was made a member of the Order of the British Empire, and the affection felt for him by his colleagues and the confidence they had in his judgement were evinced by his election to the Council of the Royal College of Surgeons and the General Medical Council. On his retirement from his university and hospital posts he was presented by his colleagues and friends with his portrait in oils, reproduced on the next page.

When the British Medical Association held its Annual Meeting at Liverpool in 1912 Mr. Thelwall Thomas acted as joint local general secretary. He had been honorary secretary of the Section of Surgery in 1909 at Belfast, and was president of the same Section in 1913 at Brighton.

Such, in brief, is an epitome of the professional career of a distinguished surgeon. But Thelwall Thomas was much more than a merely brilliant operator. He was a man with a thousand and one fine qualities of head and heart. From his boyhood he showed grit and perseverance. Alone, by his own unaided efforts, he hewed out his career. He had no powerful influences to aid him; nothing but his own fine courage and his own great gifts. In his youth he had a hard struggle, but the memory of it did not embitter him, but rather made him more sympathetic to young men in like cases. Genial by disposition and generous in heart, he won and kept his friends. He was never jealous of his junior colleagues. He was ever ready to lend them help from his large experience and to encourage them in everything worthy they endeavoured to achieve. But he did not suffer fools gladly, though his judgements were charitable. He tested his men out. If they were true metal he took them to his heart, and once admitted to that sanctuary it was not by any will of his that they left it. He rendered innumerable kindnesses to colleagues; he was generous without ostentation, and he was constantly doing little "acts of service and of love" that none but the recipients ever knew of. He was gifted with a fine sense of humour; he had the Celtic sense of the dramatic, and he could tell an excellent story.

In 1892 he married Anabel, daughter of the late Alexander Spence of Huntly, Aberdeenshire. As already stated, she predeceased him about two months ago. They had no children.

Personal Tributes.

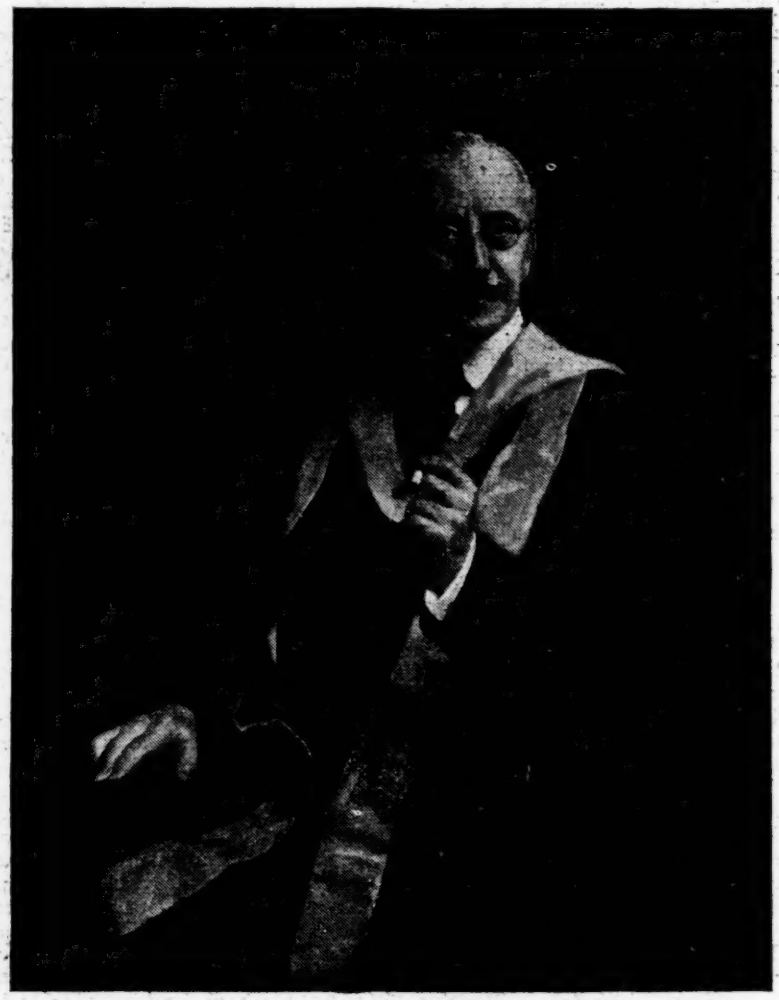
We have received the following appreciations of Mr. Thelwall Thomas's work and character from Sir Robert Jones, Bt.; Sir James Barr, who was President of the British Medical Association during the Annual Meeting at Liverpool in 1912; Mr. C. Thurstan Holland, lecturer in radiology in the University of Liverpool; Mr. F. T. Paul, consulting surgeon to the Liverpool Royal Infirmary; and Mr. R. E. Kelly, professor of surgery in the University of Liverpool.

Sir Robert Jones writes:

The passing of Thelwall Thomas is a great loss to surgery, a painful shock to his friends, and has cast a deep gloom over his native city. He was a surgeon who, from earliest days, earned the respect of his profession and the warm affection of his colleagues and his friends. He was marked out from the beginning as possessing qualifications which made, not merely for success, but pre-eminence. Not only a brilliant but an industrious student, he displayed a critical and well balanced mind, with that uncommon quality—a sense of proportion. His academic successes were constant and conspicuous. But what a wilderness of brilliant students we have known who have fallen by the way, whose early promise never fructuated—their energies blasted by the cold wind of lethargy and inanition. Thomas earned his reputation because he was an earnest student all his life. I remember him in his early days at his humble rooms in Mount Street, always at work, cutting sections, elaborating notes, classifying cases—never for one moment idle. How rare it was in those days to be disturbed by a patient!—the gods protected him. Would that the gods always protected men of promise from the tragedy of early success. Thomas realized, what all students should realize, that undergraduate study is an aim, and not only an achievement. It is the armour carefully welded and fitted to prepare for the battle of life. As a graduate he worked conscientiously and long because he loved to work. Even in those days he realized his destiny and, like a good labourer, he ploughed his furrow straight. He knew no short cut to success. His path was not made easy for him. He had no professional influence to place him in positions of vantage. He owed his enviable reputation solely to his gifts of intellect and, what is equally important, character. In the true and highest sense he was a self-made surgeon. Every successive post he held was an *inevitable* appointment; in each he more than justified his selection. Thelwall Thomas had another great asset—he had faith in his future. He steadfastly refused to be deflected from the career he had planned. I remember in the years of early struggle a very tempting offer was made to him to become lecturer in anatomy at one of our large medical schools. He refused the post when its acceptance would have immensely improved both his financial and academic status. No! he determined to become a great surgeon, and to live and practise in his native town. When a man has attained to greatness we are apt to forget the early struggle and the bitter disappointments, and to speak instead of golden opportunities. The most abiding reputation is founded on triumph over obstacle. Thomas realized that each victory makes us stronger for the fight to come. "What credit to be dropped on Fortune's Hill; the merit to climb it."

In Thomas's early days surgical posts were very few, and

a weary apprenticeship had to be served before even minor official rank was obtained. Spade work was not merely a figure of speech; it was wellnigh exhausting. He had to prepare lectures for his seniors, diagrams for teaching, grind students for their examinations, and in those days it was not always that the sweet spirit of generosity was lavished by the master upon his slave. Let us hope that this old oppressive and suppressive atmosphere has been dispelled, and has passed for ever from amongst us, and that those who have attained high position and influence will remember their own early days, and in remembering make the path easier for those who follow them. Who can deny, however, that in Thomas's case the hard and strenuous path he so cheerfully traversed made his progress so irresistible and his position so unassailable? But we have not all the inflexible determination, the will to succeed, or the philosophic appreciation of the stimulus of failure.



W. Thelwall Thomas 1925

Once given position and responsibility Thomas's rapid advance was assured. He was a great asset to hospital and to university. No more devoted teacher could be found, no more conscientious hospital surgeon. Many a time when we have been at a quiet dinner he has dropped his knife and fork with dramatic suddenness to answer an emergency hospital call. Even in his early days his technique was irreproachable, and his manual dexterity a source of affectionate envy. He was a really great operator—bold but never reckless; rapid but never hurried; equally at his ease in zones of danger as in safe and simple areas. He inspired confidence and transformed an intricate operation into an artistic spectacle. When shall we ever see again a calculus which has lost its way in the ureter so caressingly removed? He was one of a very few surgeons who covered with equal facility the operative field in all departments of general surgery. When we read his interesting contributions we feel they are far too few. That brain of his contained information which would have been a great gift to the surgical world. Thomas was great, not alone because he was a skilful operator, but because he had what we may call a true surgical instinct. He possessed not only the highest qualities of surgical technique, but that sound judgement so essential to the best interests of those entrusted to his care.

Only two months ago his wife, to whom he was passionately attached, died after a prolonged and painful illness. His agony was pathetic, and there can be no doubt he died of a broken heart. A man of sterling integrity and transparent honesty has crossed over, leaving only sweet memories behind.

Sir JAMES BARR writes:

By the untimely death of Mr. W. Thelwall Thomas Liverpool has lost a very brilliant surgeon and a worthy citizen—a man who was held in high esteem by the medical profession and the public. His generous professional acts endeared him to a large number of the poor and needy, while he was ever ready to help his professional brethren in their difficulties.

He was the most dexterous operator which Liverpool has had since the days of Mr. Edward Bickersteth. As with Bickersteth, so with Thelwall Thomas: when an operation was decided on there was no hesitation about the methods; every detail was carried out with rapid decision, a steady hand, and unerring judgement. Thomas was always averse to prolonged anaesthesia, and the only time he was apt to become impatient was when the anaesthetic was imperfectly administered. He was not only a brilliant operator, but he was also an excellent diagnostician, and never operated for the sake of operating or of earning a fee. The number of exploratory operations performed by Thomas were few and far between. A short time ago he was requested to do such an operation in a case of jaundice. He refused, saying it was true the man had jaundice, but behind that there was advanced carcinoma of the head of the pancreas, and he could not live more than three months. All that could be done was to render the patient comfortable and treat symptoms as they arose. An operation would be wholly unjustifiable; it would not be surgery. The friends were not satisfied that everything had been done; another surgeon was called in who operated, and the patient was dead within six weeks.

Thomas took a warm interest in the work of the British Medical Association, though he never had time to waste over its medico-political aspects. The great success of the Annual Meeting in Liverpool in 1912 was in no small measure due to his indefatigable energy as general secretary. Everyone connected with the meeting will readily remember how difficulties were smoothed over by his never-ending fund of good humour. I have had many opportunities of expressing my personal gratitude, and I now wish to place on record how much the Association is indebted to this versatile and genial surgeon.

He took a wide interest in the progress of medicine and in the advancement of our profession. A successful surgeon himself, he recognized that the chief struggles were in the lower walks of the profession; as he said to me, "There is always room at the top." He became a member of the Council of the Royal College of Surgeons, and on the death of Dr. Caton he was elected

to represent the Liverpool University on the General Medical Council—a better selection could not have been made.

Why or how he died I cannot wait to inquire, but I unhesitatingly say that there are many men who could, in the interests of the public, have been better spared. The death rate among medical men is much too high; they should set a good example to the public by preserving their own health and intellectual vigour.

After all it is not the length of life but its efficiency which should count, and there are very few men who were more efficient in their day and generation than Thelwall Thomas. By his early death the loss to the public and the medical profession has been great, and my wife and I feel that we have lost a dear personal friend.

Mr. THURSTAN HOLLAND writes:

It is one of my privileges that I have been one of Thelwall Thomas's friends since the days when he first started as a pioneer of modern-day surgery in Liverpool—the first man who ever practised pure surgery in Liverpool, and declined any case which was not surgical. This, perhaps, is not generally known, but it is nevertheless quite accurate. There was no surgeon in Liverpool before his days who entirely restricted his practice to surgical patients. In this respect Thomas showed one of his great characteristics—his capacity to vision the future. It is not my right to speak about him as a surgeon—that must be left to his surgical colleagues—but I can speak of him as a friend and as a member of the same hospital staff. In the early days of my connexion with the Liverpool Royal Infirmary I was thrown very intimately into Thomas's work. The *x*-ray diagnosis of kidney stones was beginning and was interesting me. Whatever success I attained in this direction was very largely influenced by Thomas. He saw at once what could be accomplished by *x* rays—far more than I did—and his encouragement and loyal support and help were ungrudgingly given. And so it was ever. Thelwall Thomas always gave his support to, and went out of his way to encourage, anyone—student or otherwise—who promised in any way to advance the science of surgery. He was a great surgeon, a great medical man; confident in himself, he inspired confidence in his patients, and his consideration for his patients was wonderful.

In his home life he was ideal, and probably a more devoted husband there never was. The last year of his life was saddened by the illness of his wife, and the strain of this must have been at times almost insupportable. No doubt this strain told on him and hastened the end, but one never heard a word of complaint. He went out quietly, sitting in a chair and reading a book, without pain and unknowingly—just the end he would have desired. His friends will miss him.

Mr. F. T. PAUL writes:

The sudden death of Thelwall Thomas is a very sad shock to a large circle of friends: to me a most unexpected shock. Few have known him longer than the writer of this short note, for as far back as about 1878 he was "walking the wards" of the Royal Infirmary when I was resident medical officer and surgical tutor. From the first contact with Thomas one recognized that he was a youth of exceptional intelligence, with an excellent capacity for work. Very early in his career he showed a special genius for surgery, and while still quite young had his foot on the ladder, up which he steadily climbed to be recognized as one of the most skilful and successful operators in the country.

Thelwall Thomas was not only skilful, but kind and helpful to a degree, and he gradually acquired a greater local appreciation than probably any Liverpool surgeon had previously obtained. He devoted himself wholeheartedly to his work, and did a great deal to advance the practice of surgery, especially by a very sound example. He was always up to date and a good judge of any real improvement, which he would rapidly assimilate and make use of. Though he worked so hard and so regularly he took good holidays, but unfortunately he had no hobbies outside his profession. If he had, and they had drawn him sometimes from his work, we might have had the pleasure of his friendship and the value of his skilful help for many years yet, but he was always absolutely devoted to his work, and nothing took him away from it but the regulation holiday which, I believe, he imposed on himself as a duty to health. Thomas, of course, held all the offices, practical and professorial, that he desired, and was esteemed, as he thoroughly deserved to be, in all. It is a sad thing for one so many years older, and never having imagined such a possibility till now, to be asked to write a line of appreciation for a man whom he has known and been in touch with as teacher, colleague, and friend for fifty years. The appreciation is best expressed in the profound sense of loss which will certainly be universally experienced by the profession and the public of Liverpool and a very wide surrounding district.

Professor R. E. KELLY writes:

The shock of Mr. Thelwall Thomas's tragically sudden death rather overpowers a just appreciation of his life. Grief at his departure numbs all other feelings, for we have lost in him a true friend as well as a great surgeon. And yet his death came as he would have wished—the sudden call faced with that courage which was the keynote of his character.

In the nineties, when he was assistant surgeon at the Royal Infirmary, it required courage to explore the cerebellum, to excise ribs, to tackle exophthalmic goitres, ureteral stones, and lung abscesses; yet Thomas did all these operations comparatively early in his career. His observation was acute, his decision rapid, and his work dexterous and complete. No detail was too small for his consideration. He had the capacity for seeing all round a problem, and once his mind was made up he stuck to his convictions with great tenacity. He read extensively, and perhaps for this very reason he wrote comparatively little, but a glance at his papers and discussions shows how far advanced he was in surgical thought.

He was a great teacher, and had always something new and interesting to impart, while his enormous experience was ever at the service of others. I worked with him constantly for over twenty years, a period of utterly happy collaboration and friendship. Thomas's integrity and ideals will always remain an inspiration to those who knew him. Surely there is no better memorial than this.

WILLIAM JOSEPH TYSON, M.D., F.R.C.P., F.R.C.S.,

Honorary Physician and Chairman, Royal Victoria Hospital, Folkestone.

DR. WILLIAM JOSEPH TYSON, a distinguished medical practitioner in Folkestone, died on September 5th, at the age of 76. He received his medical education at Guy's Hospital, where he was later house-physician and resident obstetrician, and obtained the diplomas M.R.C.S., L.R.C.P. in 1874, and in 1876 the F.R.C.S. by examination. In 1879 he graduated M.B. of the University of Durham, proceeding M.D. two years later. He obtained the diploma M.R.C.P.Lond. in 1889, and in 1901 was elected a Fellow of the Royal College of Physicians. He was an original member of the Association of Physicians of Great Britain and Ireland and regularly attended its meetings. He was a justice of the peace for Kent and chairman of the Bench for the Elham Division.

Dr. Tyson commenced practice in Folkestone in 1876, where his father had long been established, though he did not join him in partnership. He devoted himself from the first to obtaining a wide knowledge of general medicine so as to fit himself for the position of consultant. He represented the South-Eastern Branch on the Council of the British Medical Association from 1897 to 1908, and was again a member of the Central Council from 1912 to 1913. He was secretary of the Section of Public Medicine at the Annual Meeting in 1886, and vice-president of the Section of Medicine in 1907. He had also been a member of the council of the Clinical Society of London. Dr. Tyson devoted himself to the interests of Folkestone Hospital for fifty years, where, in addition to his duties as physician, he had charge of the ophthalmic department. He held the post of chairman of the hospital for a long period, and

as recently as last August received Prince Henry on the occasion of the opening of a new wing. His literary publications included *Notes and Thoughts from Practice*, which was reviewed in our issue of July 31st, 1909 (p. 269), and several papers in medical journals on pulmonary and surgical subjects. His last contribution, dedicated to his colleagues at the Royal Victoria Hospital, was noticed in our issue of March 26th, 1927 (p. 572).

A colleague writes: Among those who have adorned the ranks of general practitioners in our time few have attained to such a position in the regard of his own profession and that of the general public as did Dr. Tyson. The fullness of his knowledge, his well garnered experience, his breadth of view, and the simple-mindedness of his aim, commanded and retained to the end the respect and affection of his medical colleagues. He was a devoted churchman and a prominent member of the House of Laity for the Diocese of Canterbury. His election to the Fellowship of the Royal College of Physicians was richly deserved as a recognition of his efforts in upholding on all occasions the dignity of his profession and in promoting the attainment of knowledge. He never seemed to grow old, preserving as he did his sense of humour, his interest in new movements, and his love of children. He had all the characteristics of a true sportsman, and was a cricketer till he was 60. He was a fair shot, even in his seventy-sixth year, and played a sound game of golf. Alert in his movements, he was also quick in his mental action, and consequently was a good debater and a valuable chairman. His rare kindliness of disposition, generous thought for those in distress, and transparent sincerity will be sadly missed by all who had the good fortune of his friendship.

EDGAR GEORGE BARNES, O.B.E., M.D.,

Pontac, Jersey.

WE regret to announce the death of Dr. E. G. Barnes, O.B.E., who formerly practised for many years at Eye in Suffolk. Edgar George Barnes was born at Starbroke, Suffolk, in December, 1848, and after private study entered St. George's Hospital. After taking the diplomas of M.R.C.S. and L.S.A. he graduated M.B.Lond. (with honours in obstetric medicine) in 1870, and proceeded M.D. three years later. At St. George's he held the posts of resident obstetric officer and assistant chloroformist.

During his forty-four years of medical practice in Suffolk he became known to many members of the profession, more especially in the Eastern Counties, and was for some years a prominent member of the British Medical Association. In 1899 he succeeded the late Dr. W. A. Elliston as a representative of the East Anglian Branch upon the Central Council and remained a member of Council until 1909. He also served for short periods on more than one of the central committees. During the Annual Meeting at Ipswich in 1900 he undertook the duties of joint honorary local secretary, and he was subsequently elected president of the East Anglian Branch. In addition to this work for the profession he took an active interest in the Medical Defence Union, holding the office of President from 1911 to 1913; while the Norwich Medico-Chirurgical Society, of which he was a past president, elected him an honorary member upon his retirement from practice. He was for many years medical officer of health for the borough of Eye and the Hartismere rural district, and was elected mayor of the borough in 1908.

He left Eye at the end of 1913 and the last twelve years of his life were spent at Pontac in Jersey. During the war he acted as County Director of the Jersey Red Cross Society, being awarded the O.B.E. in 1920. He became an active member of the Société Jersiaise and served on its executive committee. He took a keen interest in the Jersey General Dispensary and other local institutions.

DR. MICHAEL BEVERLEY, who was associated with Dr. Barnes as joint honorary secretary of the East Anglian Branch writes: Edgar Barnes was one of the best workers for the Association, and to him was due the great success of the Ipswich meeting, when Dr. Elliston was President. He was a splendid organizer.

WE regret to record the death of Dr. PERCY ALLAN, a leading practitioner of Croydon. He will be greatly missed by his fellow practitioners, to whom he had endeared himself by his strong personality and genial manner. Arthur Percy Allan was born at Chislehurst in 1868, and after five years' study at Birkbeck College entered Guy's Hospital Medical School. He graduated M.B., B.S.Lond. in 1894, and in 1898, after holding the posts of clinical assistant and house-physician at Guy's, he proceeded to the M.D. degree. During a large part of his successful career as a general practitioner Dr. Allan acted as surgeon to the St. John Ambulance Association, and during the war he was medical officer in charge of Wallacefield Hospital, which served as an auxiliary to the 4th London General Hospital. His war services were recognized by the award of the Medaille du Roi Albert. Dr. Allan was a man of varied tastes, and his literary ability was shown in a number of contributions to our columns and those of other medical journals. He was long a member of the Croydon Division of the British Medical Association, and was at the time of his death vice-president of the Surrey Branch. He was one of the founders and the first president of the Croydon Medical Society, and for several years acted as its honorary secretary. It was largely due to his interest and efforts that the society reached the high position it now holds. Dr. Allan leaves a widow but no children.

Medical News.

THE new winter session will open at the Middlesex Hospital Medical School on Tuesday, October 4th. The introductory address, entitled "The paths to the stars," will be delivered at 3 p.m. at the Queen's Hall by Mr. Victor Bonney, M.D., M.S., F.R.C.S., after which the prizes gained during the past year will be distributed by the Right Hon. Lord Justice Sargant. The annual dinner will be held the same evening at 7 for 7.30 p.m., at the Savoy Hotel (Embankment entrance), with Mr. Somerville Hastings, M.S., F.R.C.S., in the chair. Dinner tickets (price 11s. 6d., exclusive of wine) may be obtained from the secretary of the Medical School.

THE inaugural address of the winter session of the Westminster Hospital Medical School will be delivered on Monday, October 3rd, at 3 p.m., by Dr. E. W. Ainley Walker, dean of the school of medicine of the University of Oxford. The annual dinner for past and present students will be held on Saturday, October 1st, at 7 p.m., in the Royal Adelaide Gallery, at Gatti's Restaurant; the chairman will be Dr. de Souza.

THE Fellowship of Medicine announces that a two weeks' course in general medicine, surgery, and the specialties will start at the Westminster Hospital on September 19th; on the same date the Royal National Orthopaedic Hospital begins a fortnight's course occupying the whole of each day. A course in cardiology at the National Hospital for Diseases of the heart from October 3rd to 15th which is strictly limited to 20. A three weeks' course at the Central London Throat, Nose, and Ear Hospital will also begin on October 3rd, and include two parts, which may be taken together or separately, the clinical part occupying the whole day, and a practical operative surgery class in the mornings, and also a peroral endoscopy course. A course in ante-natal work will be held at the Royal Free Hospital by Professor Louise McIlroy on Fridays, at 5 p.m., from October 7th to 28th; the course is strictly limited to 10. On Wednesdays, at 5.15 p.m., from October 12th to November 2nd, Dr. C. B. Heald will give lectures and demonstrations in electrotherapy. Other courses will be given at the Chelsea Hospital, the Royal Eye Hospital, the London School of Hygiene and Tropical Medicine, and the Paddington Green and Victoria Hospitals for Children. A two months' course in neurology at the National Hospital, Queen Square, starts on October 3rd, consisting of attendance at the afternoon clinics at the hospitals and certain special lectures. Copies of syllabuses and of the general course programme may be obtained from the Secretary of the Fellowship, 1, Wimpole Street, W.1.

HEALTH WEEK will be celebrated from October 2nd to 8th in various parts of the country; lectures, demonstrations, and exhibitions will be arranged, and prizes for essays on "The health road to happiness" will be awarded to school children. Further information and suggestions for programmes may be obtained from the Secretary, Health Week Committee, 90, Buckingham Palace Road, S.W.1.

THE annual dinner of past and present students of University College Hospital, London, will be held at the Hotel Cecil on Friday, October 14th, at 7 p.m. Sir George Blacker will be in the chair.

THE "John Hampton Hale" Research Laboratory of the Royal Dental Hospital of London will be opened on October 4th, at 4 p.m., by Sir Walter Fletcher, M.D., F.R.S., who will also distribute the prizes to the students.

WOMEN students are now to be admitted to the Royal Veterinary College, Camden Town, for the complete course of instruction for the diploma of the Royal College of Veterinary Surgeons.

THE Sims Woodhead course of lectures in constructive health education, arranged by the Medical Council of the People's League of Health, will begin on Thursday, October 13th, at 6 p.m., in the lecture room of the Medical Society of London. Particulars may be had from the honorary organizer of the league, Miss Olga Nethersole, 12, Stratford Place, W.1.

THE British Institute of Philosophical Studies has arranged the following courses of lectures for next term: Professor Alexander, "Value"; Mr. John Hobson, "Economics in relation to ethics"; Professor Leonard Russell, "The approach to philosophy"; the Director of Studies, "Introduction to philosophy"; Dr. William Brown, "Psychology." A full syllabus can be had from the Director of Studies, 88, Kingsway, W.C.2.

DR. TOM HARE, B.V.Sc., M.R.C.V.S., of the Lister Institute of Preventive Medicine, London, has been appointed to the Chair of Pathology at the Royal Veterinary College. He graduated in medicine at the University of Liverpool in 1924 and proceeded M.D. last year.

DR. ADAM WILSON, V.D., J.P., of Newcastle-upon-Tyne, has been appointed a Deputy Lieutenant for the county of Northumberland.

AN abridged form of *The British Pharmacopoeia* has been translated into Chinese by Dr. C. L. Kao, and has been published under the auspices of the London Chamber of Commerce and the British Chamber of Commerce, Shanghai. It may be obtained from the London Chamber of Commerce, 1, Oxford Court, E.C.4, price 6s.

THE *Revista Sud-Americana de Endocrinologia, Inmunologia, e Chimioterapia* offers three prizes for the best works in Spanish, Italian, French, German, English, or Portuguese on endocrinology, immunology, or chemotherapy. Works that can be used for commercial purposes are excluded. The value of the first prize is 1,000 pesos (£86) and of the second and third 500 pesos each. The award will be made by a committee consisting of university professors and the editor of the *Review Rivadavia*, 1745, Buenos Aires, to whom the works should be sent before September 30th.

THE Osiris prize of 100,000 francs of the Institut de France has been awarded to Dr. Charles Nicolle, Director of the Pasteur Institute of Tunis, for his work in acute infectious diseases, especially in connexion with typhus, measles, and Mediterranean fever.

THE Bureau of the Far East at Singapore reports that during the week ending August 6th there were 12 cases of plague, all fatal, 443 cases of cholera with 261 deaths, and 100 cases of small-pox with 22 deaths.

MESSRS. BAILLIÈRE, TINDALL AND COX announce for early publication a new and enlarged edition of Dr. Muthu's *Pulmonary Tuberculosis: its Etiology and Treatment.*

THE report of the Professional Classes Aid Council (251, Brompton Road, S.W.3) for 1926–27 shows a steady appreciation of its work. The council began as a war relief fund in 1914, and in the following six years it dealt with 12,000 applications for help. Distress among the professional classes did not end with the war, and the obligation remains to aid those who suffer as much as any and make no parade of their sufferings. The applications prove that there is permanent need of the council's work. Its policy is to avoid doles. Immediate help is given where necessary, but the endeavour is to set professional men and women on their feet. A great part of its work is bridge building, tiding over temporary difficulties and helping people to permanent work. A correspondent wrote: "Your Council appears to be a sort of 'superman' institution, overlapping the more than sixty societies whose names are given. I do not understand why the professional classes with their numerous societies do not look after their own members." The reply was that these societies do all they can, but their funds are often administered under conditions that cut some applicants off from help. Some assist only their own subscribers, some may only aid those with definite qualifications. There is no overlapping, for there is intercommunication in regard to any particular case that it appears possible may be provided for by another society. There is co-operation. Its income last year was just over £8,000; of this £5,500 was spent in the assistance of cases, mainly by way of paying fees for education.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the BRITISH MEDICAL JOURNAL alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the BRITISH MEDICAL JOURNAL must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the JOURNAL, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the BRITISH MEDICAL JOURNAL are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

CONSULTING ROOM COUCHES.

"COUCH" asks for information about consulting room couches, not too inartistic in design.

*** The Medical Supply Association (167–185, Gray's Inn Road) has a couch of the kind; the specimen we saw was in oak and was covered with brown pegamoid, but it could be made in mahogany. It had an adjustable head or back rest, which could be flat with the rest of the couch or raised at any angle. The cost was £10. A similar couch, made by the Holborn Surgical Instrument Company (Thavies Inn, Holborn Circus), is of polished mahogany or walnut colour, with adjustable back rest and sliding tray. Its price, with straight legs, was £6; with cabriole legs, 15s. more. The same firm had a more expensive couch, though not more pleasing in appearance, embodying a three-action movement. The price, plain upholstered, was £10 15s., and button upholstered, £11 10s. Messrs. W. H. Bailey and Son, Ltd. (45, Oxford Street, W.), supply several types of adjustable couch, with frames of mahogany, oak, or walnut, and upholstered in rexine of any colour to suit the other furniture. The prices range from £7 7s. to £10 15s.; detachable leg sections, crutches, and sockets are extras. Messrs. Mayer and Phelps (59–61, New Cavendish Street, W.) have a consulting room couch with an adjustable end, upholstered in pegamoid; it can be made in birch, stained mahogany, oak, or walnut, from £6 10s. The price of a similar couch, adjustable at both head and foot, and with nickel plate leg crutches, for lithotomy position, is £13 15s. We believe that all the firms mentioned are prepared to build a couch to any design to suit the other furniture of the room.

LETTERS, NOTES, ETC.

PELVIMETRY.

DR. J. G. M. MOLONY (Truro) writes: Professor Munro Kerr states the obvious truth in saying that he considers the foetal head the best pelvimeter, and describes a modification of Müller's method of examination—namely, pressing the foetal head down with one hand into the pelvis, then passing two fingers of the other hand into the vagina and estimating the degree of overlapping of the foetal head with the thumb of this hand. The only difficulty I have had is that if the fingers are passed far into the vagina—say in the region of the sacral promontory—one needs an abnormally long thumb to reach the top, or just over the top, of the symphysis pubis. I suggest, therefore, the following modification:

The foetal head is pressed down as before with one hand, the forefinger of the other hand is passed into the vagina *against* the symphysis, and overlapping tried for with the thumb of this hand; overlapping is again tried for with the same thumb, but this time the forefinger is just *below* and internal to the symphysis. Of course the other methods, such as estimating the distance of the sacral promontory, are tried as well.

This method may of course, for all I know, be well known, but I have never seen it described or heard it mentioned.

A PALATAL REFLEX.

DR. R. ANDERSON (Birmingham) records the case of a lad, aged 17, who complained of a clicking noise in his mouth occurring when he was unable to breathe through his nose owing to a cold. He could produce the same noise by pinching his nose. There was a rhythmic click-click 156 times a minute, which became slower with deep or rapid breathing. The soft palate could be seen moving up and down like a diaphragm. Dr. Anderson adds that he has never heard of a similar occurrence.

DIPHTHERIA SIMULATING FOREIGN BODY IN THE THROAT.

DR. CHARLES J. HILL AITKEN (Kilnhurst, near Rotherham) writes: A woman applied to the casualty department complaining that she had swallowed a fishbone and that she was certain it had stuck in her throat. She was referred to the throat department, where it was found she was suffering from diphtheria in the larynx. This is the opposite to the case recorded in the *Epitome* of August 20th (para. 141).

HERPES AND VARICELLA.

MR. J. E. RUDDLES, lately a student at the Livingstone College, Leyton, and now engaged in missionary work in Paraguay, reports a case of the association of herpes with subsequent varicella. A typical unilateral herpes rash developed in an Indian, with the usual pain and symptoms; it ran the customary course and cleared up in ten days. A fortnight later the patient's child developed varicella, with a typical rash and slight fever, and a week later his wife became affected. Four other mild sporadic cases occurred subsequently in people living in the next house. Mr. Ruddles adds that chicken-pox is not endemic in the sparsely populated district concerned, nor is it otherwise epidemic at the present time.

DR. F. W. BLAKE GREAVES (Annandale, New South Wales) sends notes of an instance of herpes and chicken-pox occurring consecutively in mother and infant. Herpes appeared first in the mother (aged 28) on October 15th, 1926; the infant (aged 4 months) began to suffer from chicken-pox on November 3rd, 1926.

DR. W. T. TAYLOR (Ballyclare, co. Antrim) notes that most of the cases recorded of the association of herpes and varicella the herpes preceded the chicken-pox when there was direct contact. He has recently seen a case in which neither of these conditions existed. The patient (a woman), who has been confined to the house for ten years on account of paraplegia, was attacked by herpes zoster on July 1st. An outside helper comes in daily to help in lifting her out of bed, etc. This helper's son, aged 7 years (not a patient of Dr. Taylor's), had had chicken-pox six days previously, but at no time could have been near the paraplegic. If there was any connexion between the two attacks it would appear, Dr. Taylor considers, infection must have been conveyed to the paraplegic patient from the boy by his mother.

DRS. C. EDE and A. K. JAMES (Calne, Wilts) write: While a large number of cases have been reported in the last few years showing the intimate relation between herpes and varicella, practically all have been instances of one disease being followed by the other after contact. The following case is of interest in that it exhibited simultaneous development of both diseases in one individual, bearing a close resemblance to two cases reported by the late Dr. Claude Ker (*Lancet*, 1920, ii, 347). On June 28th a man, aged 39, consulted us and stated that four days previously he had pain in the right side of his chest; on the following day a "rash" developed in that situation. One day later he noticed spots on the trunk and arms. He was found to have typical herpes zoster of the fifth right dorsal nerve, the vesicles being especially marked in the region of the lateral and anterior cutaneous branches. Scattered over the trunk and arms typical vesicles of varicella were to be seen.

ETIOLOGY OF RHEUMATIC INFECTION.

DR. IRENE N. CLOUGH (Bristol) wishes to support the suggestion of "C. M. H." (Hong-Kong) (JOURNAL, August 13th, p. 290) that the study of diseases prevalent in temperate climates might be greatly aided by noticing their incidence in tropical and subtropical climates. Does rickets really not occur in Hong-Kong? She states that when working at the Holdsworth Memorial Hospital in Mysore City she was so struck by the extreme frequency of rickets among the out-patient children that she made observations on 200 children, selected at random: they were continued for two months or more, and the English sister in charge of out-patients undertook the clerical work. Dr. Clough had to leave India on account of health shortly after and the records were lost, but she recalls that the points noted were: age, religion, method of feeding; date of teething, walking, and closure of fontanelle; beading of ribs, presence of Harrison's sulcus. Roughly, one-fifth of the patients were Mahommedan, nearly four-fifths were Hindu; both these were of all classes. In Mysore City, as in other parts of South India, purdah is rare among Brahmins and high-caste Hindus. A small percentage of patients were Christian (Roman Catholic and Protestant); the Protestant section were the more prosperous, but neither section was wealthy. Most children were breast-fed. Of the bottle-fed babies she believes she noted that every child showed marked symptoms, the older children especially displaying every sign: late walking, late teething, and barrel-shaped chest, with well-marked sulcus. Hand feeding was not a success in Mysore City. Some were fed on milk, others on patent foods. Any patent food could be obtained in the city, and the sale of patent medicines was enormous. Out of 200 children 199 showed beading of the ribs. The one exception was the child of Eurasian parents, where the father was earning good wages. These observations were made in a year when conditions were at their worst after the war: high food prices, shortage of housing and of employment. Mysore City is 2,500 ft. above sea-level and the climate is subtropical. Dr. Clough never noticed the thermometer on the verandah register a higher temperature than 96° F. or lower than 60° F. The city was within a rain-belt area of 30 in. to 50 in. a year. There were three months of hot weather; the rainy season was from June to October, but rain might fall in any month. There was no cold season. Sanitation, on the whole, was good—certainly far ahead of most Indian cities. The notes were taken from January to March—that is, during the end of the cool season and the first two months of the hot season.

HAEMORRHAGE IN THE NEWLY BORN.

DR. R. D. ATTWOOD (Royston, Herts) writes: In view of the two cases of haemorrhage in the newly born recently recorded in the BRITISH MEDICAL JOURNAL the following is of interest. On July 29th I was called to a baby 2 days old and found that a considerable quantity of blood had been brought up; the amount was difficult to estimate, being, of course, on cloths; it was certainly over half a pint. The treatment adopted was the administration of saline by the rectum and the intramuscular injection of 1 grain doses of calcium chloride. Slight haemorrhage continued for a few days, but subsequently there was a complete recovery.

TYPHOID FEVER IN MONTREAL.

FROM March 1st to June 28th, 1927, there were notified in the city of Montreal 4,755 cases of typhoid fever with 453 deaths, as against 37 cases with 11 deaths, 48 cases with 18 deaths, and 44 cases with 21 deaths, for the period March 1st to June 30th of the years 1926, 1925, and 1924 respectively. It appears, therefore, that since the beginning of last March Montreal has suffered a severe epidemic of typhoid fever with a case-incidence in proportion to population probably unknown in any other large city in the world within the present century. No evidence was obtained that either the city water supply or the city sewerage system was responsible. The disease was distributed over the greater part of the area of the city with much more concentration in proportion to population of some sections than in others. It was found soon after the beginning of the outbreak that a very large proportion of those infected had drunk milk from a certain dairy company, and that a very considerable proportion of the milk which entered and was distributed from the plant had escaped efficient pasteurization.

SCHILLER'S DISEASES.

DR. ERIC EBSTEIN of Leipzig, who is the author of clinical studies of Goethe, Chamisso, Kotzebue, Lessing, Newton, and others, has recently devoted attention to the pathological history of Friedrich von Schiller (*Forschungen und Fortschritte*, May 20th, 1927). The poet, as is well known, started life as an army surgeon, but the success of his romantic play, "The Robbers," made him quit medicine for literature. It is noteworthy that two years before the publication of his play Schiller had written three articles on medical subjects, one of which, on the difference between inflammatory and putrid fever, contained the clinical history of his friend August von Hoven. Physically Schiller was of a delicate and asthenic constitution. At the age of 23 he had a severe attack of influenza, and in the following years, during his residence in Mannheim, he suffered from malaria, which was then very prevalent in the Rhine district, where even now it is occasionally met with in the summer. This attack of malaria was severe and, in spite of quinine, he had several relapses. In 1787, at the age of 29, he first developed symptoms which may be regarded as manifestations of intestinal tuberculosis, from which he suffered until his death eighteen years later. During this period he contracted whooping-cough from his children and was laid up for over six weeks. His so-called attack of cholera in 1797 must be regarded as one of the manifestations of intestinal tuberculosis, while the "red dysentery" of 1804 and another attack in 1805 are interpreted by Dr. Ebstein as possibly an indication of ileo-caecal tuberculosis. His sufferings were only known to his intimate friends and fellow poets—Goethe and Korner: from all others, Wilhelm von Humboldt states, he carefully concealed them. Dr. Ebstein relates that the last word he uttered was "naphtha," by which he meant Hoffmann's drops, then much in vogue for the treatment of colicky pain.

THE "MEDICAL REGISTER": UNTRACEABLE PRACTITIONERS.

"STILL ON THE REGISTER" writes: While having every sympathy with the Registrar of the General Medical Council in the number of non-replies to his inquiries, it does seem somewhat strange that such names as that of the late Professor Starling and the still living Sir Thomas Smartt should be included. We are all fallible and many of us very casual, but I think that the *Medical Register* might be checked with the *Medical Directory* (which, after all, is really to most of us more important in a sense) and, where the address is unaltered, the benefit of the doubt of our present existence be given us.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 37, 38, 39, 42, and 43 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 40 and 41.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *132*.